The Dynamics of Dyadic Coping: A Micro-Analysis of Couples' Stress Conversations

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Abstract

Maintaining an intimate relationship during stressful times requires coping efforts of both partners. How couples engage in these dyadic coping efforts has been investigated thoroughly, however, the underlying micro-processes have not been understood yet. The aim of this thesis was to investigate mutual, dynamic dyadic coping processes, which unfold within real-time interactions of partners engaging in a stress conversation. In detail, it was tested how actual behaviors of stress communication, listening, and dyadic coping are linked throughout the course of the conversation. Analyses were based on observational data of two large datasets (N = 127 and N = 365 couples). Results of the empirical contributions presented in the current thesis confirm that it is crucial to study dyadic coping as a dynamic process. Three main conclusions can be summarized: (1) Dyadic coping reactions match stress communication within matters of seconds, (2) prompt listening is associated with beneficial dyadic coping reactions during the conversation, and (3) more satisfied couples differ in their listening behavior compared to less satisfied couples. The current work provides a framework for future investigations and is of particular practical significance for couples. Extending this line of micro-analytical research in the future might be a promising pathway to understand dyadic coping processes in the intimate relationship.

Zusammenfassung

Partnerschaftliche Unterstützung ist maßgebend für die Beziehungsqualität, vor allem in Zeiten hoher Belastung. Wie Paare miteinander mit Stress umgehen und sich unterstützen wurde zwar eingehend untersucht – Mikroprozesse der Unterstützung sind allerdings noch nicht ausreichend verstanden. Der Fokus dieser Arbeit liegt auf wechselseitigen, dynamischen Echtzeit-Copingprozessen welche während partnerschaftlichen Gesprächen stattfinden. Die vorliegende Arbeit untersucht wie die konkreten Verhaltensweisen der Stressäußerung, des Zuhörens, und des dyadischen Copings im Verlauf von Copinggesprächen miteinander in Zusammenhang stehen. Analysen basierten auf Verhaltensbeobachtungsdaten zwei großer Datensätze (N = 127 und N = 365 Paare). Ergebnisse der drei empirischen Studien bestätigen, dass dyadisches Coping als ein dynamischer Prozess angesehen und untersucht werden sollte. Drei Hauptschlussfolgerungen können zusammengefasst werden: (1) Dyadische Copingreaktionen werden der Stressäußerung innerhalb weniger Sekunden angepasst, (2) promptes Zuhören ist mit vorteilhaftem Unterstützungsverhalten während des Gespräches assoziiert, und (3) zufriedenere Paare unterscheiden sich in ihrem Zuhörverhalten von weniger zufriedenen Paaren. Die vorliegende Arbeit bietet aufgrund der mikroanalytischen Untersuchungen eine Basis für zukünftige Forschung und ist von praktischer Relevanz für Paare.

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Preface

Partner support in stressful times is crucial. Whereas an extensive amount of studies hints to the finding that partner support and dyadic coping have beneficial effects on the relationship, life satisfaction and health, hardly any empirical work has been conducted on the micro-processes that take place during couple's conversations when talking about stress. Accordingly, the aim of this thesis was to gain further insights into the dynamics of the stress-coping process, and contribute to knowledge on methodological and statistical procedures for micro-analyses as well as, with regards to content, on stress communication, listening, and dyadic coping reactions during a couple conversation.

This thesis is based on two studies with observational data of couples talking about a stressful situation which have both been funded by the Swiss National Science Foundation (SNF 100014-115948, SNF 100014-129627, SNF CRSI11_133004/1). Chapter 1 starts with describing stress as it affects the relationship. Chapter 2 then introduces how couples dyadically cope with stress and how this has been postulated in theoretical models. Subsequently, Chapter 3 demonstrates that stress and coping should be understood as a process unfolding over time, and continues describing the different partner behaviors that are part of the process. Chapter 4 summarizes couple interventions building up on the aforementioned stress and coping process. Whereas in Chapter 5, measurement approaches of the stress-coping process are presented, Chapter 6 elucidates analysis methods of observational data. Chapter 7 highlights the dynamic characteristics of the stress-coping process that can be analyzed with intensive observational data. The research objectives of the current thesis are illustrated in Chapter 8. The three empirical studies that are investigating the dynamics of the stress-coping process are presented in Chapters 9 to 11. The general discussion recapitulates the findings from the empirical studies and integrates them into a broader context (Chapter 12). Lastly, practical implications are reflected for future research and clinical work with couples.

Introduction and Literature Review

"*Even when we engage in ordinary conversation in everyday life,*
if someone speaks with human feeling we enjoy listening, and respond accordingly;
the whole conversation becomes interesting"
– Dalai Lama XIV

1. What is Stress?

According to the American Institute of Stress (2014), 73% of the population regularly experiences psychological symptoms caused by stress, and 77% report experiencing physical symptoms caused by stress. Also in Switzerland, stress nowadays seems to be a ubiquitous phenomenon that is in consequence under ongoing investigation in research. Although the term "stress" was already used in the 14th century as an expression for hardship, straits, or adversity, as early as in 1936, Hans Selye pioneered the field of stress research and concluded that stress had negative impacts on health (Lazarus & Folkman, 1984). Many decades later, Lazarus and Folkman (1984) defined stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (p. 19). This definition differs from former conceptualizations in that it is less the stressful event itself but its *appraisal* that ultimately leads to a stressful experience. Stress is caused by neither the situation nor the person but only by the interaction of those two variables, and can thus be very subjective and varying across situations.

1.1. Stress and the Relationship

Stress has detrimental effects on physical and mental health and well-being on the individual level (e.g., Anderson, Litzenberger, & Plecas, 2002; Lupien, McEwen, Gunnar, & Heim, 2009; Maslach & Leiter, 1997). However, stress often not only affects the individual but also the close social environment such as the relationship with the intimate partner, which is the smallest social entity. Stress within the dyad is a distinct form of stress because partners share common concerns, experience emotional intimacy, and have to deal with the continuity of the dyad as a social system (e.g., the maintenance of the marriage; Bodenmann, 2005). Dyadic stress is thus an interpersonal process that can be categorized along several dimensions (Bodenmann, 1995a): (a) It can affect either directly or indirectly both partners of

the relationship. (b) It might originate from inside or outside of the relationship. For instance, relationship-external stress, such as high pressure at work is different from stress that roots within the dyad such as conflicts between the partners. (c) It can involve different time points when each partner becomes affected. For example, the stressor can affect both partners at the same time, at different time points, or in a sequential fashion.

These assumptions are based on systematic observations of the influence of stress on dyadic interactions: The EISI-Experiment (Experimentally Induced Stressful Interaction; Bodenmann, 1995a; Bodenmann & Perrez, 1992, 1995) revealed that stress and coping in couples were not individual processes but that stress can become relevant for both members of the dyad and affect it as a whole (e.g., joint appraisals in addition to individual appraisals). When individual strain is high or the stressed person cannot cope adequately, as observed in the EISI-Experiment, external stress - even if previously unrelated to the partner - spills over into the dyad (Bodenmann, Ledermann, & Bradbury, 2007), and increases tensions within the couple (Falconier, Nussbeck, Bodenmann, Schneider, & Bradbury, 2015). For example, stress experienced by one partner throughout the day in the workplace has been observed to spill over into the dyad and lead to decreased intimacy and conflicts between the partners (Bolger, DeLongis, Kessler, & Wethington, 1989; Repetti, 1989; Schulz, Cowan, Cowan, & Brennan, 2004).

1.2. Effects of Stress on the Relationship

Research consistently shows that stress has detrimental effects on relationship quality and stability (for an overview on stress in Swiss couples see Kuhn, Hilpert, & Bodenmann, 2016; Randall & Bodenmann, 2009). Especially chronic relationship-external stressors such as daily hassles (e.g., missing the bus, a harsh comment from a colleague) seem to have a strong negative impact on the relationship. Frequent daily hassles are also among the most relevant predictors for divorce (Bodenmann, Charvoz, et al., 2007), even in comparison with critical life events such as cancer or the death of a close relative (Bodenmann, 2000; Bodenmann, Ledermann, et al., 2007). One reason for the impact of daily hassles on relationship functioning might be that daily hassles are often accompanied by other people's lack of understanding for the subjective significance of the situation. After a harsh comment from a colleague at work, for example, the stressed partner[1] might have experienced feelings of uncertainty, inferiority, or loneliness. Meanwhile, the non-stressed partner might judge the

[1] The term "stressed partner" is used as a simplification to show which partner is disclosing about a personal stressor. This term does not imply that the other partner might not be stressed as well.

partner's reaction as inadequate and exaggerated, thus creating distance between the two partners. Because the harmful effects of chronic daily hassles mainly happen outside of conscious awareness, they lead to mutual alienation and slowly erode relationship quality, as also postulated by the stress-divorce model (Bodenmann, 2000, 2005). This model posits that chronic external stress negatively affects relationship satisfaction via four processes. First, time that partners spend together decreases so that there are fewer opportunities to experience shared positivity (Milek, Butler, & Bodenmann, 2015). Second, the quality of communication decreases when stressed. In fact, Bodenmann (1995b) could observe a 40% decrease of communication quality when couples were experimentally stressed. Further studies also report more conflicts and arguments when stress is high (Bodenmann, Ledermann, et al., 2007; Bodenmann, Meuwly, Bradbury, Gmelch, & Ledermann, 2010; Ledermann, Bodenmann, Rudaz, & Bradbury, 2010). Third, external stress is associated with a higher risk for physical and psychological problems. For instance, Falconier et al. (2015) observed lower physical and psychological well-being when daily life was experienced as stressful. Lastly, the model posits that external stress increases the likelihood for the expression of problematic personality traits. For example, psychological and physical aggression are reported more often when stress is high (Bodenmann, Meuwly, et al., 2010). Ultimately, chronic external stress leads to relationship dissatisfaction and dissolution (e.g., Buck & Neff, 2012; Langer, Lawrence, & Barry, 2008; Story & Bradbury, 2004), also in the long-term (Bodenmann & Cina, 2005; Neff & Karney, 2004; Story & Bradbury, 2004). Even for newlyweds, facing more severe chronic stress predicts greater declines in marital satisfaction over the early years of marriage. This finding also holds after controlling for differences in the general level of satisfaction (Karney, Story, & Bradbury, 2005).

2. Coping with Stress in the Relationship

In order to buffer the harmful effects of stress on the relationship, intimate partners can engage in joint coping efforts – a process also termed dyadic coping (e.g., Bodenmann, 2000, 2005). In fact, the partner is not only an important source of support (e.g., Beach, Martin, Blum, & Roman, 1993; Julien & Markman, 1991) but also most usually the first person people turn to when stressed. Research reported that it is up to seven times more likely that a stressed individual turns to the partner than to a close friend (Bodenmann, 2000). Support or dyadic coping of the partner differs from social support from other family members or friends (e.g., Bodenmann, 2005; Cutrona, 1996; Denoff, 1982).

The Systemic Transactional Model[2] (STM; Bodenmann, 2005; Bodenmann, Randall, & Falconier, 2016), which is built on the individual-centered transactional stress model by Lazarus and Folkman (1984), differs from previous frameworks in that it extends the focus on the individual to the couple coping with stress. The STM emphasizes dyadic, interpersonal, and process oriented aspects of coping. In detail, the STM postulates (a) a systemic and procedural understanding of stress, in which stress is seen as dyadic (as described above), (b) a systemic definition of the coping process whereby the couple is using dyadic, hence joint resources, and (c) a typical temporal pattern of the stress-coping process (i.e., Cascade model; Bodenmann, 2000, 2005) as will be described later on in Chapter 3. The STM thus accounts for the situational variability of the stress-process which is continually changing.

Bodenmann (1995b, 2000) assumes that appraisal processes that are similar to the ones described for individual coping take place in intimate relationships. Lazarus and Folkman (1984) define individual coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). Using a process approach to coping, the individual thus appraises a certain situation as stressful. A first, primary appraisal contains an evaluation of a certain situation as stressful, irrelevant or positive (1a appraisal). In a 1b appraisal, the non-stressed partner evaluates whether the situation is taxing for the other person. In order to facilitate a correct 1b appraisal, on the one hand, the stressed partner needs a certain competence and motivation to disclose, whereas on the other hand, the other partner needs decoding competences of verbal and nonverbal signals enabling him or her to understand the stressed person. The 1c appraisal is thought to recognize whether the other partner has perceived the own appraisal. During the 1d appraisal, both partners' appraisals are compared. If these appraisals lead to the conclusion that the well-being of one partner or the dyad is threatened, one's own resources as well as dyadic and couple-external coping resources are evaluated in order to estimate whether these resources suffice a given situation or not (2a appraisal). Similarly, it is appraised how the partner evaluates the resources (2b appraisal), and finally, both appraisals are being compared (2c appraisal). Finally, analogous to the reappraisal of Lazarus and Folkman, the partners judge the effectiveness of their coping efforts, which might influence subsequent coping strategies.

[2] For an overview of other models in the context of families and couples, such as the ABC-X model focusing on major stressors (Hill, 1958; Burr, 1973) or the vulnerability-stress model (Karney & Bradbury, 1995), see Randall and Bodenmann (2009)

3. The Stress-Coping Process

According to the STM, dyadic coping is a *process* involving not only both partners' appraisals but also joint coping efforts to deal with the situation. On the behavioral level, one partner signals some stress, which the other partner perceives and decodes. Subsequently, the stressed partner might receive some verbal and nonverbal coping reactions by the supporting partner. Figure 1 (Bodenmann, 2000, p. 52) displays the interaction between the stress communication of one partner as well as the reaction of the other partner, and depicts how this process takes place in a dynamic, interactive fashion.

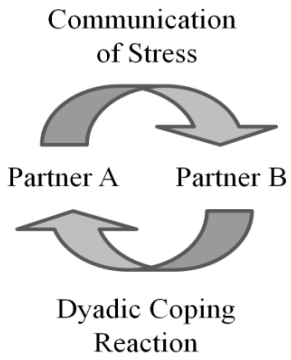

Figure 1. Interaction between stress communication and dyadic coping

3.1. Process-Oriented Models

Besides the STM, there are several models that also focus on the process of supportive couple interactions. Pearlin and McCall (1990), for example, describe a model that similarly views the stress-coping process as unfolding in a sequential fashion. They differentiate between three stages. First, the support provider perceives that his or her partner is stressed and that support might be needed. Next, in a second stage, the support provider evaluates the situation to decide whether to offer support and what form of support the support seeker needs. This analysis is comparable to the appraisal processes in the STM. Additionally, the support provider makes judgements about the kind of support that is available (i.e., resources) and how likely it is that the support will be successful. Based on the judgements of the second stage, support is being provided (or not) in the last stage. In comparison to the STM, Pearlin and McCall do not differentiate between different types of stress communication or support.

Another model that closely resembles the aforementioned process of dyadic coping is the intimacy process model originally proposed by Reis and Shaver (1988). The intimacy process model includes an explanation how closeness and intimacy evolve from a couple conversation. During the postulated intimacy process, self-disclosure and partner responsiveness are the two key components for achieving intimacy. When one partner opens

up and reveals some personal information in form of thoughts and feelings, and the listener is able to convey that he or she is being attentive to and aware of central disclosed aspects (Gable, Reis, Impett, & Asher, 2004), the speaker might perceive the listener as understanding, validating, and caring. This perception is based on the listener acknowledging the recipient's feelings and needs, conveying acceptance, protecting the recipient's self-esteem, and respecting the recipient's point of view (Collins, Guichard, Ford, & Feeney, 2006). Subsequently, partners experience feelings of intimacy and connectedness. Empirical evidence supports the assumptions of the intimacy process model. For example, Laurenceau, Barrett, and Pietromonaco (1998) showed that self-disclosure and perceived partner disclosure predicted intimacy levels in interpersonal exchanges. Results were replicated in marital interactions in a diary study (Laurenceau, Barrett, & Rovine, 2005) or with partners where the female partner had breast cancer (Manne et al., 2004). However, the intimacy process model is not specifically stress-related and, hence, does not distinguish between different forms of stress-related self-disclosure and coping reactions, but points out to the importance of the process itself.

3.2. Stress Communication

One competence in the stress-coping process is self-disclosure that is related to the stressor, hence, how people talk about the stress they have experienced. Research on stress and coping refers to the disclosure about a personal relevant stressor with terms such as "stress communication" (e.g., Bodenmann, Meuwly, Germann, Nussbeck, Heinrichs, & Bradbury, 2015; Bodenmann et al., 2016), "stress expression" (e.g., Kuhn et al., 2017), "support seeking" (e.g., Collins & Feeney, 2000; Iida, Seidman, Shrout, Fujita, & Bolger, 2008; Verhofstadt, Lemmens, & Buysse, 2013), or stress-related "(self)-disclosure" (e.g., Bowen et al., 2013; Cutrona, Shaffer, Wesner, & Gardner, 2007; J. H. Kahn, Hucke, Bradley, Glinski, & Malak, 2012). In the following, we will use the terms "stress communication" and "stress expression" to describe the behavior of the stressed person communicating stress to the partner and requesting his or her support for coping (indirectly or directly).

The STM differentiates between different forms of stress communication and coping reactions (Bodenmann, 2000). Figure 2 depicts different forms of stress communication different between emotion-oriented and problem-oriented as well as hidden and open communication (Bodenmann, 2000, p. 53).

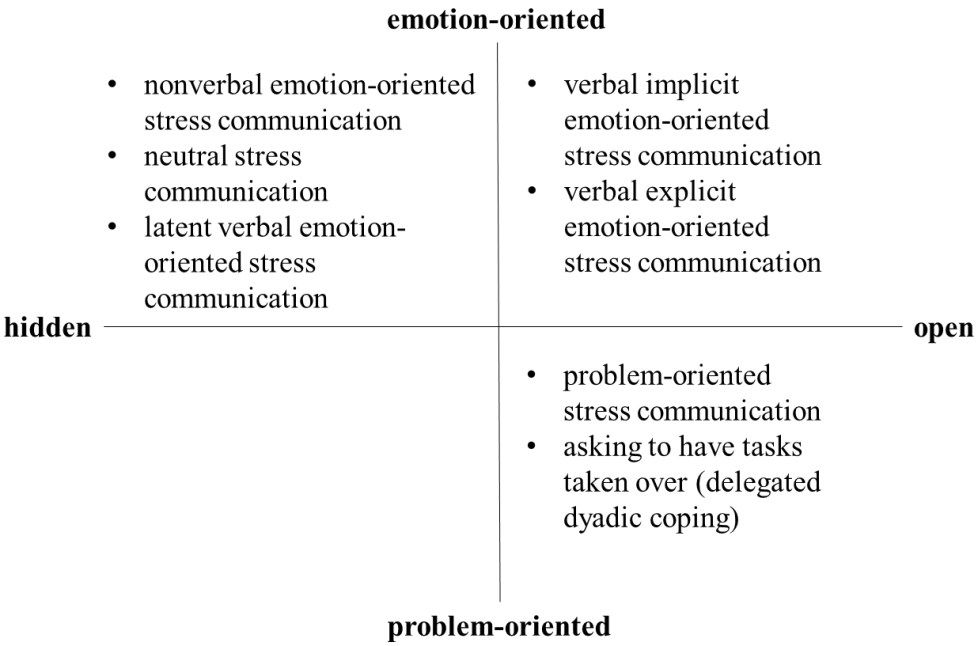

Figure 2. Different forms of stress communication

Problem-oriented stress communication refers to asking for problem-related information, advice, or support. For example, one might ask for reassurance whether a task has been done properly, how the partner would solve the task, or how he or she thinks the task could be solved more efficiently. Similarly, one can ask the partner explicitly to help taking over some tasks. *Nonverbal emotion-oriented stress communication* includes nonverbal signals to express emotional distress which should also be recognizable as such (e.g., sighing, irritated tone of voice, taciturnity, closed body position). *Neutral descriptions* fall into the category of neutral stress communication and include seemingly emotionally relevant descriptions that nevertheless remain factual and narrative without any direct reference to the emotional significance of the stress. Similarly, *latent verbal emotion-oriented stress communication* is characterized by rather neutral, factual descriptions of a stressful situation but differs from neutral stress communication in that it has more of an appellative character. The partner is given to understand that the situation was stressful via, for example, cynicism or grief. *Verbal implicit emotion-oriented stress communication* contains implicit demands for emotional support from the partner, such as indirect and superficial descriptions of the experienced emotions (e.g., “I was annoyed”) or self-depreciating expressions, but does not offer explicit information about the stress origin or emotional condition. *Verbal explicit emotion-oriented stress communication*, on the other hand, encompasses concrete descriptions of thoughts and feelings related to a stressful experience. Thus, stress communication can

range from rather hidden statements of stress that have to be decoded more thoroughly by the other partner to more explicit, overt descriptions of stress.

Other theoretical distinctions of people seeking for help contain, for example, positive and negative support seeking (Verhofstadt et al., 2016). Positive support seeking might include a clear analysis of the problem, the recognition of the partner as an aid and agreement with the partner's suggestion. Rejecting help, criticizing the supporting partner, or making complaints fall under the category of negative support seeking.

3.2.1. Functions of stress communication

Generally, communicating one's stress enables the person to share the experience in order to alleviate stress (e.g., Frattaroli, 2006; J. H. Kahn et al., 2012) and to mobilize support from the close partner (Bodenmann, 2005). Hobfoll and Lerman (1989), however, point out that the resources to mobilize aid might differ among persons ("…those who have the best potential to mobilize support on their own behalf", p. 63). Different ways of communicating stress also matter. Explicit emotion-oriented stress communication, for example, which might be shown by opening up on the feelings associated with a specific stressful situation, is seen as the most favorable because they allow the partner to fully understand not only what happened during the situation but also how and why the stressed partner felt that way (Bodenmann, 2007). It enables the listening partner to relate to and understand the stressed partner. With this increased understanding, there are fewer possibilities for wrong interpretations and, consequently, fewer misunderstandings. In addition, this form of stress communication has the strongest appellative character for dyadic coping of the partner. When explicitly saying that someone felt hurt, alone, or embarrassed, it becomes clearer for the supporting partner what support might be needed. Communicating stress directly, rather than indirectly, is more likely to launch a successful support exchange (Gleason & Iida, 2015).

Bodenmann (1995b) observed that more happy couples have a higher chance that their partners will react with understanding and support because they express stress more competently, for example, with less ambiguous nonverbal messages. Further, satisfied couples dare more to open up and explicitly express their feelings towards the partner (Antill & Cotton, 1987; Bodenmann, 1995b; Hendrick, 1981). Stress communication, as measured in questionnaires, is linked with relationship satisfaction (Bodenmann, 1995b). This finding is in line with results showing that revealing feelings is linked more strongly with closeness than revealing facts (Reis und Shaver, 1988). These findings on the link between emotional self-disclosure and beneficial relationship outcomes are manifested in the intimacy process model (Reis & Shaver, 1988; see Chapter 3.1).

Additionally, talking about stress on an emotional level facilitates the own understanding of why a certain situation was stressful and thus creates personal insights about the origin of stress (Suedfeld & Pennebaker, 1997). Further, studies using written self-disclosure show that expressing emotions about a stressful experience have beneficial long-term effects for the individual (Pennebaker, Colder, & Sharp, 1990; Pennebaker, Kiecolt-Glaser, & Glaser, 1988). Frattaroli's (2006; also see Richardson & Rice, 2015) meta-analysis summarized that written emotional disclosure reduced distress and was associated with better immune system functioning, health behaviors, and positive work-related outcomes. Communicating stress, especially by talking about feeling, therefore seems functional for the stressed individual as well as for the intimate relationship.

3.2.2. Gender differences in stress communication

Past research does not provide a clear picture on whether men and women differ in stress communication. Often, only few, if any, gender differences in disclosure are reported (Bograd & Spilka, 1996; Burleson, Kunkel, Samter, & Working, 1996), whereas some studies support the finding that women communicate their stress more often (e.g., Bodenmann, 1995b; Bodenmann et al., 2015; Dindia & Allen, 1992). Sultan and Chaudry (2008) found that female university students reported more emotional self-disclosure than the male students did. Vingerhoets and van Heck (1990) observed that women indicate higher expression of emotion and support seeking than men, which is also in line with findings from Bodenmann and Perrez (1991). Women also score higher in reports of chronic and acute stress (Matud, 2004; Neff & Karney, 2005). Inconsistent findings are reported for gender differences in problem-oriented stress communication: Whereas Bodenmann and Perrez observed that men indicate more problem-oriented stress communication, other studies (Bodenmann, 1995b; Bodenmann & Widmer, 2000) show that women are higher in both problem- and emotion-oriented stress communication.

Despite inconsistent findings about the baseline levels for men and women, one finding is reported more regular in literature: men's stress communication seems to have a higher impact on women's relationship satisfaction than vice versa (Bodenmann, 1995b), showing that it is more important for women that their partners also open up during times of stress. Widmer (2001) assumes that the difference of the effect on the relationship satisfaction can be explained by the different baseline levels of stress communication between men and women. Women might be less used to their partners expressing stress than vice versa, so that a male partner's stress expression is more "special", thus having greater impact on the relationship.

3.3. Partner's Reaction to Stress Communication

The way people respond to a personal disclosure is as important as the disclosure itself (Maisel, Gable, & Strachman, 2008) - a finding often discussed in the context of responsiveness. In the intimacy process model, Reis and Shaver (1988) define responsiveness as behaviors conveying understanding, validation and caring. Given the close link between the STM and the intimacy process model, responsiveness might be comparable to a supportive dyadic coping reaction. More recently, Wilson, Martire, and Sliwinski (2017) tested responsiveness in arthritis patients and defined daily responsiveness as "the degree to which spouses' responses are calibrated to changes in patients' everyday verbal expression" (p. 1). Similarly, a whole field of research has begun investigating perceived partner responsiveness, which is based on the "belief that relationship partners both attend to and react supportively to central, core defining features of the self" (Reis, Clark, & Holmes, 2004, p. 203). Responsiveness can be communicated verbally and nonverbally, including concrete behaviors (Reis & Patrick, 1996). Responsiveness, however, differs slightly from social support or coping in that it plays a role not only in situations of adversity (Cutrona, Hessling, & Suhr, 1997) but also in times of good fortune, as further elaborated in studies about capitalization (Gable, Gonzaga, & Strachman, 2006; Gable et al., 2004). Compared to dyadic coping in the STM, responsiveness is thus more broadly, however, less clearly defined. In the following, listening and dyadic coping reactions, which are both described in the STM, will be subsumed as possible partner's reactions to stress communication.

3.3.1. Listening

One behavior during conversations that is mentioned in the context of responsiveness is listening (Laurenceau et al., 2005; Pasupathi, Carstensen, Levenson, & Gottman, 1999; Reis & Shaver, 1988). Listening is often compromised out of several behaviors showing interest and attention towards the partner expressing stress. These can include back-channeling behaviors that are defined as head nods, eye contact, a forward body lean, or brief, noncommittal acknowledging responses, e.g., "uh-huh" or "I see". Listening can also take the form of paraphrasing what the stressed partner has talked about, or asking open questions to encourage the speaker to elaborate further on the stressful issue (Bodie, Gearhart, Denham, & Vickery, 2013; Weger, Bell, Minei, & Robinson, 2014). Invitations to say more, for example, "Tell me about it" or "I'd like to hear about that" encourage the speaker to self-disclose as well. These elements reflect Rogers' basic variables of interpersonal empathic listening (Rogers, 1951). However, there is no consensus yet in how listening is conceptually defined

in coding systems (Bodie, 2011). For example, the Specific Affect Coding System (SPAFF; Gottman & Krokoff, 1989) differentiates between low-level (e.g., keeping eye contact with the speaker, head nods, "mmh") and high-level (e.g., paraphrasing) positive listening, whereas Jones (2011) distinguishes between passive (nonverbal) and active (e.g., asking clarifying questions) listening strategies. Others describe listening as "active empathic listening" which includes actively asking questions increasing mutual understanding and trust (Gottman, Coan, Carrere, & Swanson, 1998; Weger et al., 2014), but differ in their precise definition.

Besides this lack of conceptual clarity, explicit research on listening seems to be rare (Bodie et al., 2013; Bodie, Vickery, Cannava, & Jones, 2015; Jones, 2011) and solely implicitly recognized listening as an important concept (Bodie, 2011), especially in couples talking about stress. Most of the time, coding schemes for spousal support include listening only indirectly, coded as one possible behavior in categories such as positive affect (Interaction Dimensions Coding System; Julien, Markman, & Lindahl, 1989), positive nonverbal behaviors (MICSEASE; Griffin, Greene, & Decker-Haas, 2004), or responsive behavior (Maisel et al., 2008) so that listening has not been analyzed individually.

In the context of emotional disclosures of stressful events, listening has two main functions: to understand how the partner feels and to convey responsiveness to the partner. First, listening is necessary to perceive and decode the partner's stress expressions in order to fully *understand* the significance of the stressful situation (Bodenmann, 1995b, 2005). Only if decoded correctly, the appraisals - as mentioned in the STM - will match between the partners. The more effective a partner thus listens, the more accurate the stressed partner's situation can be understood (Garland, 1981). Additionally, listening attentively also conveys understanding to the stressed partner (Bavelas, Coates, & Johnson, 2002; Cahn & Frey, 1992). Second, listening attentively signals that the listening partner is interested and cares about the stressed person. For example, active listeners are *perceived* as more responsive (e.g., Reis, Lemay, & Finkenauer, 2017) and supportive (Collins & Feeney, 2000). In turn, partners feel more intimate (Prager & Buhrmester, 1998; Reis & Shaver, 1988) and satisfied (Cahn, 1990) after having disclosed about a personal stressor.

A few critical voices have been raised concerning the amount of empathic engagement during listening. For example, Bodie and colleagues (2013) criticized that, in the little research so far, it is mainly the activity of listening that was being measured. However, according to them, it is more important to additionally examine the emotional involvement including empathy (Weger, Castle, & Emmett, 2010) than solely partner's activity of listening. Jones (2011) mentions that there are differences between "casual" and "supportive"

listeners, similar to Doell (2011) who distinguishes between “listening to understand” and “listening to respond”. Although this differentiation seems comparable to the two functions of listening as mentioned above, Doell describes “listening to understand” as patient, nonjudgmental, and empathic listening where partners not only try to understand what the partner is saying but also what the partner is feeling, whereas “listening to respond” is mainly seen as a superficial reaction to the partner talking without seeking deeper understanding (p. 2). The latter has a stronger emphasis on the own reaction than what the partner is attempting to convey. In consequence, it might be perceived as less helpful, so that this definition of “listening to respond” differs from the beneficial listening behavior this thesis is focusing on.

Another conceptual discussion has come up concerning the question whether listening can be considered as support. In fact, stressed individuals seek out support from others whom they view as good listeners (Bodie et al., 2015). Whereas listening thus can be seen as a form of support (Jones, 2011), in the stress-coping *process*, listening should come before any verbal coping efforts with the function of decoding and understanding what further support would be needed. It remains thus a matter of definition whether listening itself can be accounted as coping effort. The definition of listening in this thesis contains both conceptualizations, listening as a condition for successful dyadic coping and listening as part of dyadic coping. These two conceptualization are derived from the two basic functions of listening: *listening to understand* mainly sees listening as a behavior that should be shown prior to subsequent coping efforts, whereas *listening to convey responsiveness* can be understood as a form of coping. How the two different functions of listening can be observed in actual behavior remains to be further investigated. In sum, listening represents a key factor for deeper understanding during dyadic coping conversations (Bodenmann, 2005) and a core competence of communication (Bodie et al., 2013).

3.3.2. Dyadic coping reactions

Bodenmann differentiates between positive and negative dyadic coping. Positive forms of coping include supportive, common and delegated dyadic coping, and can further be distinguished by emotion-oriented or problem-oriented dyadic coping, similar to Lazarus and Folkman (1984) describing individual coping. Besides individual coping and social support from others, Figure 3 (Bodenmann, 2000, p. 55) provides an overview of the different forms of dyadic coping as described in the STM.

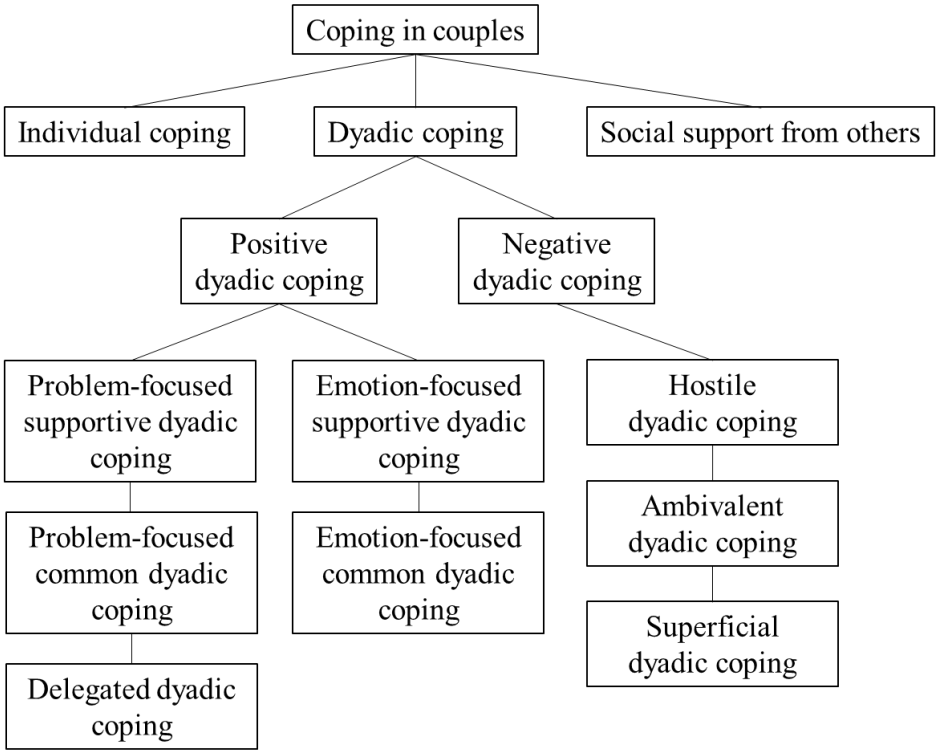

Figure 3. Forms of dyadic coping in the STM

Supportive dyadic coping is often delivered by showing understanding, appreciation, validating the partner's feelings, helping to shed a different light on the situation, hugging, or helping the partner to calm down. These are all examples of emotion-oriented supportive dyadic coping. On the other hand, giving advice or information, or helping the partner to analyze the situation are problem-oriented supportive dyadic coping behaviors. Emotion-oriented dyadic coping is thus aimed at changing one's own emotional response to the situation, whereas problem-oriented dyadic coping is aimed at improving some factual aspect of the stressful situation.

Common dyadic coping involves joint coping efforts of both partners in order to deal with the stress. Both partners are usually involved symmetrically and contribute equally to the coping process. Common dyadic coping might contain strategies decreasing emotional tension, such as relaxing together, or problem-oriented strategies, such as searching tangible solutions for a problem together.

Delegated dyadic coping takes place when one partner delegates activities or tasks (e.g., looking after the children, buying groceries) to the other partner. In contrast to supportive dyadic coping, the partner is explicitly asked to take over the task. Moreover, delegated dyadic coping aims to focus on the solution of a problem rather than the reduction of emotional tension (Bodenmann, 1995b, 2000, 2005).

Negative dyadic coping subsumes support that is perceived as unhelpful and sometimes even not intended to be helpful. It can take three forms: hostile, ambivalent, and superficial dyadic coping. Hostile dyadic coping includes degrading, sarcastic comments with a clear disinterest. In contrast to hostile dyadic coping with an obvious negativity, ambivalent dyadic coping is rather subtle and mainly para- or nonverbal. The partner might show some support but - due to a lack of authentic empathy - might instead convey the feeling that the stress is not taken seriously at the same time. Superficial dyadic coping is characterized by a certain distance and apathy towards the speaker and includes meaningless truisms.

3.3.2.1. Functions of dyadic coping

According to Bodenmann, dyadic coping has two main functions: 1) reducing the stress of both partners by restoring the couple's homeostasis, and 2) strengthening the cohesion of the couple by fostering feelings of we-ness (Bodenmann, 2005; Cutrona, 1996). Stress is reduced through joint efforts of both partners working together as a team, thereby preventing stress spillover causing intradyadic stress (e.g., Falconier et al., 2015). Accordingly, the relationship is perceived as a supportive resource in difficult circumstances. In fact, perceiving the partner as reliable and supportive in stressful times increases mutual trust, commitment, intimacy, and ultimately strengthens the couple relationship. For example, hardships such as chronic illnesses often increase partner's cohesion and sense of a unit (Traa, De Vries, Bodenmann, & Den Oudsten, 2015) when partners jointly engage in coping efforts. Furthermore, a successful coping process enhances model learning for future individual, and, most likely, also dyadic coping efforts (Bodenmann, 2000).

3.3.2.2. Dyadic coping and relationship outcomes

Dyadic coping is an important factor in maintaining marital quality and stability (e.g., Bodenmann, 2000; Bodenmann & Cina, 1999, 2005). It also belongs to the most relevant predictors of relationship functioning (e.g., Herzberg, 2013; Julien & Markman, 1991; Landis, Peter-Wight, Martin, & Bodenmann, 2013; Papp & Witt, 2010; Pasch & Bradbury, 1998), as even observed in several meta-analyses (Falconier, Jackson, Hilpert, & Bodenmann, 2015; Hilpert et al., 2016). On the other hand, the absence of dyadic coping is a main predictor for relationship dissolution (Bodenmann & Cina, 2005). As discussed, stress can have harmful effects on the couple's relationship. Dyadic coping moderates this association by buffering the negative effects of stress on the relationship. Simply put, couples who are regularly exposed to stress but have efficient coping competences are able to buffer and counteract a stress-related decrease of relationship satisfaction (Bodenmann, 2005). Besides effects on relationship satisfaction, studies show that dyadic coping is related to general communication

(Bodenmann, Meuwly, et al., 2010; Ledermann, Bodenmann, Rudaz, et al., 2010), tenderness (Bodenmann, Pihet, & Kayser, 2006), and sexuality (orgasms, sexual satisfaction; Bodenmann, Atkins, Schär, & Poffet, 2010; Bodenmann, Ledermann, Blattner, & Galluzzo, 2006; Bodenmann, Ledermann, et al., 2007).

The more effective both partners can handle the stress, the more favorable the trajectory of their relationship quality will look like (Bodenmann & Cina, 2005). Therefore, dyadic coping also covariates with relationship quality in the long-term. Couples could be correctly classified with an accuracy of 73% whether they would separate or stay together after 5 years according to their level of dyadic coping in the beginning. Even after 10 years, prior dyadic coping could predict men's relationship satisfaction (Ruffieux, Nussbeck, & Bodenmann, 2014). Especially emotion-oriented supportive dyadic coping served as a strong predictor for marital satisfaction (Bodenmann & Cina, 1999, 2005).

Effects of dyadic coping can also be observed on the physiological level of the individual. Meuwly and colleagues (2012) observed that cortisol being released after a stress induction decreased faster the more positive supportive coping the stressed person received. Similarly, Schaer, Ditzen, Heinrichs and Bodenmann (2007) found that a dyadic coping intervention also had effects on the physiological level. Couples recovered faster from a conversation about a stressor not only emotionally but also physiologically as observed with the heart rate. In addition to subjective ratings, dyadic coping therefore additionally reduces stress on objectively measurable levels.

3.3.2.3. Gender differences in dyadic coping

Gender differences in support reactions are not consistent (e.g., Bodenmann et al., 2015; Donato et al., 2015). Observational studies have reported similar effects for the amount and type of social support that men and women are providing (L. J. Roberts & Greenberg, 2002; Sullivan, Pasch, Johnson, & Bradbury, 2010), however, men seem to be less able to provide adequate support in situations where they are also stressed (Bodenmann et al., 2015). In a similar vein, when assessed with questionnaires, Arshad and Iqbal (2016) observed that wives seem more likely to engage in positive dyadic coping whereas men are more likely to engage in negative dyadic coping when being stressed themselves. Women report more emotion-focused coping and men more problem-oriented coping (e.g., Ptacek, Smith, & Dodge, 1994; Roussi & Karademas, 2016), however, women might also feel pressured to apply to the common stereotype of women being better supporters. Donato et al. (2015) assert that gender differences on dyadic coping may have been overstated since the focus is lying more often on differences than similarities. A more consistent finding though is that women's

relationship satisfaction is more dependent of the male partner's coping behavior than vice versa (Acitelli & Antonucci, 1994; Bodenmann, Pihet, et al., 2006; Gmelch & Bodenmann, 2007; Papp & Witt, 2010; Roussi & Karademas, 2016), similar to the finding that male stress expression seems to matter more. Women's stronger orientation towards the relationship might explain this gender difference (see Cross, Bacon, & Morris, 2000).

3.4. Linking Stress Communication and the Partner's Reaction

Coping reactions require stress communication and listening. These three elements are strongly linked and compromise core aspects of the dyadic coping process. If the dyadic coping reaction is to be perceived as responsive, two conditions should at least be met: content-related matching and timing. Rafaeli and Gleason (2009) describe these conditions as the *how* and *when*, in addition to the *who* (provider and receiver). These aspects are thus relevant for the consideration of the quality of the dyadic coping reaction as a response to a type of stress communication. Matching and timing will be described in the following.

3.4.1. Matching

Since stress is a subjective experience with plenty of different feelings being involved, it is unquestionable that there are also different needs about care and support. Early studies rather focused on the stressful *situation* (Cutrona, 1990; Cutrona & Russell, 1990; Thoits, 1986), but later on, the process of *support seeking* itself was also taken into account (Iida et al., 2008). Cutrona and colleagues (2007) videotaped couples engaging in self-disclosure tasks and found that following emotional disclosure, partners were perceived as more responsive when they provided emotional support, whereas problem-focused support was negatively evaluated. Their conclusion was that support is most beneficial when it matches the specific needs (see also S. Cohen & Wills, 1985). Several models such as the Optimal Matching Model (Cutrona & Russell, 1990), the Social Support Effectiveness Model by Rini and Dunkel-Schetter (2010) and the Skillful Support Model (Rafaeli & Gleason, 2009) emphasized the significance of matching support. Whereas these models mainly focus on the fact that the reaction has to match, it is also important to consider that the response might depend on the clarity of the stress communication itself. For example, when support seekers expressed their needs more clearly (e.g., by higher levels of disclosure), their partners also reacted with more helpful support (Collins & Feeney, 2000). This is in line with the STM stating that a clear stress communication facilitates a correct appraisal of the listening partner (Bodenmann, 2000). As a conclusion, first, dyadic coping should match the needs of the

stressed person, and second, the matching is facilitated by a clear and unambiguous stress communication.

3.4.2. Timing

Another factor that plays a role for adequate support is time contingency. Collins, Ford, Guichard, Kane, and Feeney (2010) differentiate between the manner in which support is provided and the degree of time contingency with the partner's needs, such as responding promptly. Inversely, they describe insensitive caregivers as "out of sync" (p. 373). Neff and Karney (2005) likewise suggest that support should be appropriate not only in content but also in timing. Promptness is an important factor in the process of emotional regulation (e.g., Henning & Striano, 2011). For instance, Stern (1985) noted that, for infant-caregiver relationships, the timing of a caregiver's reaction matters for the affective attunement. In the context of intimate relationships, a prompt reaction is likewise perceived as well-intentioned and useful (Bodenmann, 2005). For example, a partner showing an immediate response might convey empathy or concern, whereas the same response might be perceived as inappropriate when delayed, such as ambivalent of superficial dyadic coping. On the other hand, a dyadic coping reaction might not be helpful for the stressed partner when it is provided too early, maybe even before the stressful experience has really been understood by the supporting partner. The listening partner needs time to really perceive and understand what the stressed partner is occupied with, and a badly timed response might induce a feeling of not being understood in the stressed partner.

In the context of timing, Bodenmann (1995b) investigated contingencies of dyadic coping reactions using 5-second periods. Contingent reactions are those that follow a stimulus after a latency period and that are clearly associated with the stimulus (Seligman, 1975). Bodenmann used a contingency index measuring the effective response rate of dyadic coping responses (e.g., emotional supportive, problem-oriented) to different types of stress communication (e.g., verbal implicit, nonverbal emotional). Analyses revealed that dyadic coping is likely to follow time-contingently stress communication. Problem-oriented dyadic coping occurred with a probability of up to 80% succeeding stress communication and emotional supportive dyadic coping had a probability of 54% following implicit stress communication. Partners reacted the least to nonverbal stress expressions, which shows that nonverbal behavior might be more ambiguous and less specific than more explicit utterances, such as openly explaining that one feels frustrated. Previous research on support activation behavior showed that direct support requests lead to more effective support receipt (Barbee et

al., 1993). Moreover, satisfied couples displayed significantly higher contingencies in their emotional coping reactions, and thus reacted more often within 5s to their partner.

Reis, Clark and Holmes (2004) state that "more than content-relevant and well-timed, a response has to involve a sense of supportiveness, caring and valuation" (p. 204). Similarly, Tickle-Degnen and Rosenthal (1990) write that interactions promoting warmth, affection, and liking are likely to contribute to feelings of acceptance and belongingness, which they describe as "rapport". Clearly, this emotional attunement might be another facet of a coping process being perceived as well-intended and helpful.

4. Dyadic coping in interventions: CCET and COCT

Several evidence-based relationship education programs have been developed targeting the communication between the partners (e.g., CCET: Bodenmann & Shantinath, 2004; EPL: Hahlweg, Markman, Thurmaier, Engl, & Eckert, 1998; Couple Care: Halford & Simons, 2005; PREP: Markman, Renick, Floyd, Stanley, & Clements, 1993). The Couple's Coping Enhancement Training (CCET) is especially designed to strengthen competences of stress communication, listening and providing helpful support, altering partners' maladaptive behavioral and cognitive processes. In addition to the CCET, a coping-oriented couple therapy (COCT; Bodenmann, 2010; Bodenmann & Randall, 2012; Lau, Tao, Randall, & Bodenmann, 2016) has been proposed.

The CCET as well as the COCT work with the 3-phase method that assigns roles of "speaker" and "listener" to the partners (Bodenmann, 2007). In the first phase of this method, the speaker is asked to shortly describe a recent stressful situation. Subsequently, the speaker continues to explore and disclose the range of emotions and cognitions being associated with the particular stressor. The therapist asks open-ended questions such as "How did that make you feel?" or "Please describe your frustration in more detail" in order to increase the speaker's access to his or her emotions. Meanwhile, the listener is instructed to listen attentively and empathically to then summarize the speaker's emotions in regular intervals. At the end of the first phase, the speaker expresses what he or she might need in order to feel supported by the partner. This first phase is intended to enhance both partners' understanding of the stress. The increased understanding is used in the second phase where the listening partner is asked to provide support concentrating on emotion-focused dyadic coping (e.g., expressing understanding, encouraging the partner). In the third and last phase, the speaker provides feedback on the received support. The 3-phase method thus aims at (a) enhancing the ability to clearly communicate stress to the partner; (b) adapting support to the specific needs

of the other; and (c) refining the ability to offer dyadic coping based on the partner's feedback (Bodenmann, 2007, 2010).

In the COCT, the 3-phase method is used to touch underlying constructs that influence the person's behavior, which resembles the method of emotionally focused couple therapy (S. M. Johnson & Greenberg, 1995). The latter, however, mainly includes interactions between the therapist and the partner while exploring underlying constructs, whereas in the COCT partners are instructed to look at each other while the therapist discretely guides the couple from the background. In effect, the couple can acquire communication and coping competences needed to independently apply them in daily life to counteract negative stress spillover effects. Despite some sort of artificiality, both CCET and COCT thus strengthen couples' interactions using the 3-phase method.

Empirical evidence on the efficacy of the CCET confirms increases in individual and dyadic coping (Bodenmann, Perrez, Cina, & Widmer, 2002; Bodenmann & Shantinath, 2004; Zemp et al., 2017), happiness (Hilpert, Bodenmann, Nussbeck, & Bradbury, 2014; Pihet, Bodenmann, Cina, Widmer, & Shantinath, 2007), and marital quality (Bodenmann, Charvoz, Cina, & Widmer, 2001; Schaer, Bodenmann, & Klink, 2008; Widmer, Cina, Charvoz, Shantinath, & Bodenmann, 2005; Zemp et al., 2017). Evidence that couples can profit from the dyadic coping approach even in a small dosage comes from a study that investigated the effects of a self-directed approach with a DVD that couples could work through on their own (Bodenmann, Hilpert, Nussbeck, & Bradbury, 2014). There is also some evidence for the efficacy of the COCT. In a comparison study with cognitive-behavioral and interpersonal therapy, COCT was as effective in improving depressive symptomatology (Bodenmann, 2008a). It also produced improvements in observed dyadic coping from pre- to post-therapy (Gabriel et al., 2008), along with relationship satisfaction and reported dyadic coping, however, not significantly stronger than the other two treatments.

5. Measurement Approaches of the Stress-Coping Process

Several measurement approaches are applied in order to fully understand stress and coping in couples. In the following, different approaches will be described in the context of dyadic coping and support processes.

5.1. Self-Report

Dyadic coping is assessed with the Dyadic Coping Inventory (DCI; Bodenmann, 2008b). This inventory covers different forms of stress communication and coping as

suggested by the STM. Both partners indicate their own and their partner's coping which allows to compare their response and calculate equity or congruence indices (e.g., Gmelch & Bodenmann, 2007; Iafrate, Bertoni, Margola, Cigoli, & Acitelli, 2012). The DCI has been translated into many languages. Given the application of the STM all over the world, a fairly wide range of couples from different countries has been assessed, allowing for cross-cultural comparisons. The STM has also been validated in different languages (Donato et al., 2009; Falconier, Nussbeck, & Bodenmann, 2013; Ledermann, Bodenmann, Gagliardi, et al., 2010; Vedes, Nussbeck, Bodenmann, Lind, & Ferreira, 2013). Other self-report data generally include interviews (e.g., Kayser, Watson, & Andrade, 2007) or diary data using momentary assessment.

Research on dyadic interactions including dyadic coping mainly relies on self- and partner-reports. However, self-report data are prone to several biases. Besides social desirability, exaggeration, mood dependency, or recall biases such as oblivion (Lucas & Baird, 2006), self-reports may contain an evaluative perspective of past behaviors and social comparisons with other couples. Moreover, measures of dyadic coping might tap marital satisfaction in general rather than the quality of partner's dyadic coping specifically, thereby increasing shared method variance. Lastly, by averaging, for example, evaluations of a dyadic coping interaction, it is impossible to disentangle different phases with self-reports due to primacy or recency effects. Kerig and Baucom (2004) therefore claim that there is a need for more observational data of couple interactions in order to measure what specific observed behaviors at what time might contribute to the overall subjective perception reported in a questionnaire.

5.2. Behavioral Observation

Observational studies on the stress and coping process overcome the limitations of self-report mentioned above, and offer several methodological strengths. Observational data provide a better portrait of the complex interaction between the partners that go beyond awareness. Gottman and Notarius (2000) claim that observational research "is the main roadway available for the precise study of family process" (p. 927).

Many marital coding systems have been developed to identify particular behaviors related with marital quality[3]. Some focus more on conflict (e.g., SPAFF: Gottman & Krokoff, 1989; Marital Interaction Coding System: Patterson, Ray, Shaw, & Cobb, 1969), whereas others are specialized to focus on supportive interactions (e.g., Social Support Interaction

[3] For an overview of different coding systems see Heyman (2001)

Coding System: Pasch, Harris, Sullivan, & Bradbury, 2004; Social Support Behavior Code: Suhr, Cutrona, Krebs, & Jensen, 2004).

On the basis of findings from the EISI-Experiment (Bodenmann & Perrez, 1992), Bodenmann (1995c; adapted version 2012) developed a coding scheme for videotaped support conversations in order to collect observational data of dyadic coping (Kodiersystem zur Erfassung des emotionalen supportiven dyadischen Copings; SEDC). The SEDC covers different forms of stress communication and dyadic coping reactions. Nonverbal behavior is coded for non- and paraverbal stress communication such as sighing or speaking with an irritated tone of voice, and nonverbal dyadic coping reactions such as body contact or smiling as a form of providing support. Verbal stress communication subsumes problem-oriented, neutral, implicit emotion-oriented, and explicit emotion-oriented stress expressions. Dyadic coping is coded for (a) supportive and common problem-oriented dyadic coping, (b) listening and asking questions, (c) supportive and common emotion-oriented dyadic coping, and (d) negative dyadic coping including the three different subforms (hostile, ambivalent, and superficial). Every 10s, trained coders evaluate whether any of the stress communication or dyadic coping behavior has been displayed by the speaker or listener, respectively. If yes, coders indicate which behavior has been observed. The SEDC is thus time-based with mutually exhaustive categories while other coding systems are event-based.

Several studies have been conducted on the basis of the SEDC (Bodenmann et al., 2015; Gabriel et al., 2008). These studies, however, have been conducted in the laboratory which limits generalizability and ecological validity. The structured paradigm using predesignated “speaker” and “listener” only allows to draw conclusions about how support interactions look like under controlled conditions of the laboratory, but at the expense of realism. On the other hand, direct examinations of interactions in real time can illuminate the naturally occurring stress-coping process. Therefore, Wang and Repetti (2014) call for more observational studies of support processes in natural settings. Another concern of observational data in general is the training of the coders to achieve sufficient reliability.

5.3. Physiological and Biological Approaches

Stress has been assessed with a range of physiological measures such as cortisol as a stress hormone, heart rate, or skin conductance. As mentioned in Chapter 3 on functions of dyadic coping above, dyadic coping is linked with a smaller physiological stress response (Meuwly et al., 2012; Schaer et al., 2007). Objectivity and the fact that participants’ responses

are difficult to fake are strengths of this measurement approach. However, physiological data are often collected in artificial laboratory settings and are prone to yield ambiguous data.

6. The Analysis of Observational Data

The growing trend for observational data has brought up new methodological possibilities that enable to answer a completely new field of research questions. With the advent of these new intensive longitudinal observational data, the application of sequence analysis seemed unquestionable. However, many studies aggregated their codings of turn-by-turn couple supportive interactions (e.g., Cutrona et al., 2007; Cutrona & Suhr, 1994; Pasch & Bradbury, 1998; Sullivan et al., 2010) instead of using the full range of information available. Thereby, important information on the dynamics of the observed interaction is lost.

Several researchers (e.g., Bradbury, Fincham, & Beach, 2000; Gottman & Notarius, 2000) have thus called for more research on the micro-level of partners' distinctive behaviors during a conversation. A few attempts on micro-processes of support have been made. Verhofstadt and colleagues (2008) studied empathy using a video-review paradigm where couples watched 30 to 60s-sequences of their own interactions and reported how they and their partner felt which enabled to calculate an index of emotional similarity and empathic accuracy per moment. Other micro-analyses focused on mutual gaze windows (Bavelas et al., 2002), dynamic state-space analyses investigating emotion regulation (Butler, Hollenstein, Shoham, & Rohrbaugh, 2014), as well as qualitative analyses on single responses of coping conversations (Pistrang & Barker, 2005). Burr, Hubler, Larzelere, and Gardner (2013) investigated affect patterns in couple interaction using 3, 6, and 9s-time lags. The latter is using similar statistical multilevel modeling techniques as will be presented in the current thesis. To sum it up, it seems that micro-analysis is gaining more attention as the methodologies to gather and analyze intensive longitudinal data are advancing in psychological research.

Methodologically, sequence analysis has been the most widely used statistical technique to detect patterns and temporal associations among behaviors within observational sessions. Sequence analysis is – as the name suggests – based on sequential data "for which some sort of continuity between data points can be assumed" (Bakeman & Quera, 2011, p. 134). However, the most popular approach of sequence analysis based on recommendations of Bakeman and Gottman (1997) does not differentiate between persons in the sense that it does not account for the dependency of the intensive data within a single person. In fact, the first step in this approach is to calculate a state-transition table for each couple separately to

then analyze all frequency tables together. Multilevel or hierarchical linear modeling (HLM) overcome this flaw by differentiating between variability that is due to between-person effects and variability that is due to within-person effects. In addition, multilevel modeling allows for covariates to be included in the model. The multilevel models therefore are able to address the three challenges that come with the observational data of the SEDC: The longitudinal aspect of sequence data, the fact that sequences are categorical, and the dyadic data structure (Fuchs, Nussbeck, Meuwly, & Bodenmann, 2017).

7. The Dynamics of the Stress-Coping Process

Behavioral observation of couples with intensive longitudinal data is interesting yet challenging and complex. Two key features characterize dyadic interactions: (a) there is a mutual influence of both partners on each other, (b) and partners adapt their behavior in a dynamic fashion. These two characteristics obviously go hand in hand, as depicted in Figure 4 (Leuchtmann & Bodenmann, in press). They can be tested with observational data and analyzed with multilevel models (Chapter 6). The dyadic coping reaction of Partner B is not only dependent on the stress communication of Partner A, but the different behaviors of both partners unfold over time, thus being sequentially connected to what has happened before. In this figure, the dyadic coping reaction also covers listening as one behavior.

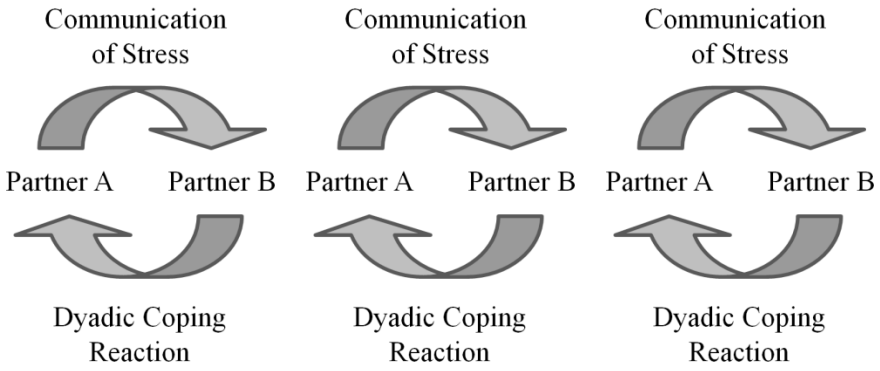

Figure 4. Dyadic coping as a systemic transactional process

7.1. Mutual Processes

According to the social learning model, the interaction pattern between partners largely determines relationship functioning (Jacobson & Margolin, 1979). Similarly, Bavelas and Gerwing (2011) posit that "microanalysis of the actions of speaker and addressee in their moment-by-moment relation to each other reveals what is not visible by studying each participant individually, in isolation from the other" (p. 196). Bavelas and Gerwing thus refer

to the mutual influence or interdependence between two partners in the sense that one person's behavior is causing subsequent changes in the other person (Kelley, 1983). The mutual influence is also being considered on the statistical level: the Actor-Partner Interdependence Model (Kenny, Kashy, & Cook, 2006) has been developed to account for the statistical dependency of both partners. Not accounting for the interdependence between the partners can bias the data since partners share or develop similarities.

7.2. Dynamic Processes

Besides mutuality, Neff and Karney (2005) emphasize that partners should "know not only how to provide their partners with positive support, but also how to *continually adjust* their support provision in response to a partner's changing difficulties" (p. 80). Since stress communication, for example, might differ in the beginning of the conversation where it might be rather factual and descriptive to a deeper, more emotional level, the partner's reaction has to be appropriate not only at the beginning but throughout the conversation. In fact, attentive listening and asking questions might convey the greatest amount of responsiveness when stressed partners begin telling about their stressful experience, but once the speaker has elaborated more, a supportive emotion-oriented dyadic coping reaction might be what the speaker would expect. In line with that, Jones (2011) points out that stress expression and listener's behaviors should be thoroughly examined "in order to capture the complex nature of both listening and providing emotional support" (p. 92).

8. Empirical Contributions

So far, most of the studies used (a) self-report daily diary designs, (b) cross-sectional self-report data, or (c) aggregated codings of observational data to investigate support processes in couples. Therefore, on the one hand, findings might be subject to several response biases. On the other hand, fluctuations and micro-processes that could give valuable insights into underlying mechanisms of dyadic coping cannot be analyzed with aggregated data. Partners' behaviors are often averaged, however, exchanges of stress communication and dyadic coping responses might be brief and fleeting. Moreover, despite the fact that couples might have different ways of reacting toward each other and thus show different within-person variation, studies often only provide between-person effects not accounting for situational variability within a person. Hence, investigating sequences rather than base rates yields information about the underlying processes that partners in a conversation are subjected to (M. D. Johnson & Bradbury, 1999).

8.1. Research Questions

The present thesis aims to investigate mutual, dynamic processes that unfold within real-time interactions of partners engaging in a dyadic coping conversation. The general research question addresses how stress communication, listening, and dyadic coping are linked throughout the course of a conversation and which functions these behaviors fulfill in the context of the relationship. As the STM as well as other process-oriented models posit, dyadic coping or support consists of multiple stages. The empirical articles assess these stages by looking at the temporal course of the different behaviors being displayed by both partners. In addition, associations between the different behaviors are described and put into the context of general relationship satisfaction. Another objective of the current thesis is thus to differentiate between satisfied and dissatisfied spouses to understand the mechanisms behind well-functioning or maladaptive couple conversations. In order to address these questions, multi-methodological research designs using two datasets with intensive longitudinal data of couples' dyadic coping conversations were employed.

8.2. Study Designs

The first dataset was collected in the study „The impact of external stress on couples' interaction" (SNF 100014-115948, SNF 100014-129627). This study took place in the laboratory with 198 couples of whom either one or both partners underwent a stress induction task (Trier Social Stress Test; Kirschbaum, Pirke, & Hellhammer, 1993). In the two

conditions where either only the man or the woman was stressed, the other partner was waiting. After their reunion, the conversations were videotaped. Partners were not explicitly instructed to discuss the stressor nor to react as they usually do as a listener during their reunion after the stressful experience. The study was designed so that couples were not aware that their discussion was part of the study since they were solely instructed to remain seated. This study is thus experimental in the sense that it involves a stress induction taking place in the laboratory. Additionally, without a clear instruction, the study allows for an observation of the couple's communication that might be slightly more natural than when explicitly asked to talk about a stress.

The second dataset is based on an extensive longitudinal study aiming to examine trajectories of relationship satisfaction and stress in the long-term in a sample with three different age cohorts ("Partnerschaft und Stress im Zeitverlauf"; SNF CRSI11_133004/1). In total, 368 couples filled out questionnaires and discussed two relationship-external and one relationship-internal stressful topics resulting in dyadic coping and conflict conversations, respectively. The three age cohorts ranged from 20-35, 40-55, and 65-80 years. For a period of five years, the couples came once per year in order to fill out questionnaires and conduct the videotaped discussions in the laboratory. In addition, these observational data were coded in an intensive longitudinal fashion for every 10s (with the SEDC; Bodenmann, 1995c; see Chapter 5.2), allowing to study dynamic micro-processes. In fact, descriptive analyses using entropy[4] as a dissimilarity index (see Figure 5) show that couples are very homogeneous in their behavioral patterns in the first sequences (e.g., simultaneous display of stress communication and dyadic coping) but become more dissimilar, for example, at sequence 20. Additionally, couples seem to show many transitions from one behavioral "state" to another, meaning that phases of stress communication and dyadic coping switch around 18 times during one conversation on average. For a total of 48 sequences with each 10s, this implies that partners change their behavior around every 30s on average. Given this high volatility, it seems highly plausible, as well as necessary, to not use averaged but micro-analytical data in order to understand the underlying mechanisms. These descriptives are similar to the data from the first dataset.

[4] Entropy is an index of the lack of predictability or dissimilarity – the higher the entropy, the less predictable and the more dissimilar from each other is the couple's behavior (Fuchs, et al., 2017)

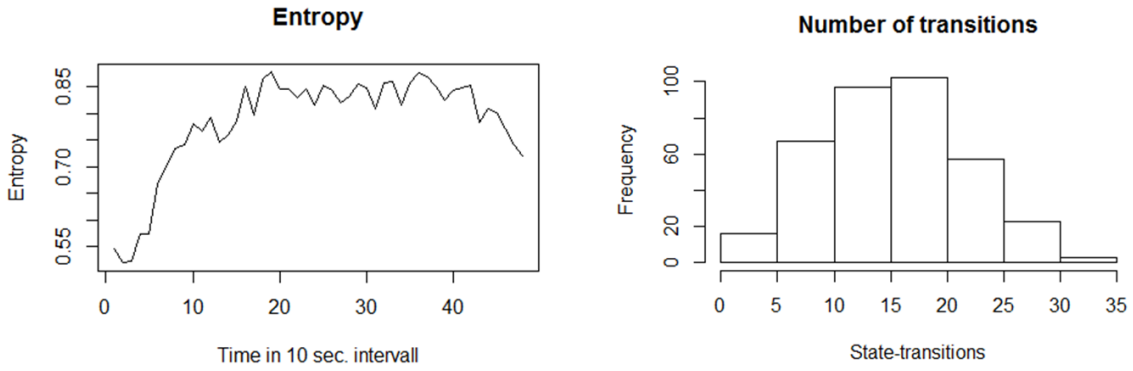

Figure 5. Entropy and number of transitions for the dyadic coping conversations

The first dataset is used for Study I, whereas the second dataset is employed for Study II and III. Drawing on the arguments outlined in the chapters above, this thesis provides three empirical studies that were conducted to fill existing research gaps and empirically test dynamic processes of stress communication, listening and dyadic coping reactions within couple conversations.

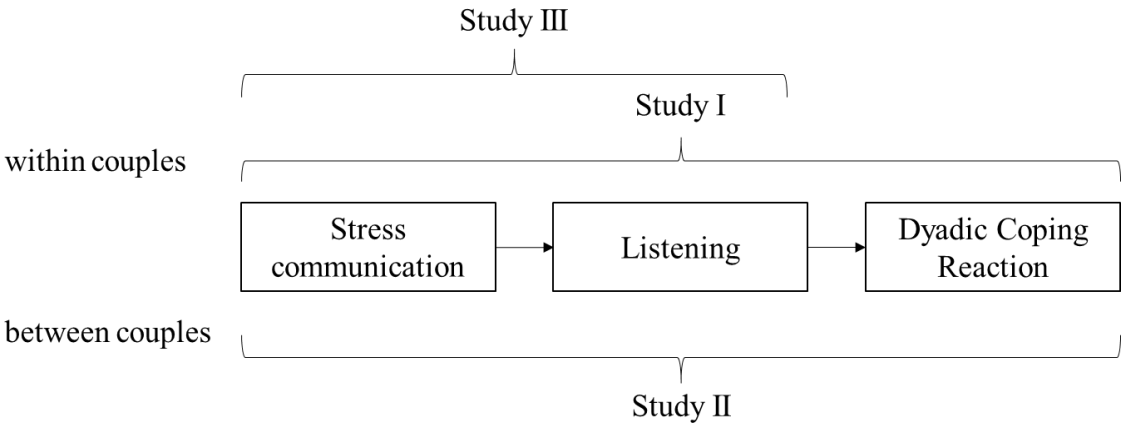

Figure 6. Overview of the empirical contributions

Study I

The STM suggests that partners base their appraisal, and subsequently their dyadic coping reaction on the way the stressed partner shows and communicates signals of stress (Bodenmann, 2000). However, this micro-process has been postulated in theory but not tested empirically so far. In this first study, the focus therefore lied on within-person associations between one partner's stress communication and the other partner's dyadic coping reaction. The study investigated whether spouses alter their dyadic coping reaction as their partner's stress communication takes different forms, such as problem-oriented or emotion-oriented, over the course of a conversation.

Observational data from 127 couples were analyzed to answer the question which stress communication of one partner is linked with which prompt dyadic coping reaction of the other partner.

Study II

The second study addressed the field of listening during dyadic coping conversations. Listening is often trained as a competence in communication interventions. However, it has not received ample attention in research yet. Using observational data from 365 couples, the study aimed to explore the different trajectories of stress communication, listening, and dyadic coping throughout the conversation. Building up on that, the study aimed to identify how listening occurred during stress communication in order to derive a score of contingent listening. Subsequent analyses tested the association between the listening score and dyadic coping reactions during the conversation as well as the satisfaction with dyadic coping and the relationship as indicated in questionnaires.

Study III

In the last study, the association between different forms of stress communication and listening was examined. We tested (a) whether emotion-oriented stress communication is more consistently related with listening in the same moment, and (b) how relationship satisfaction moderated the association between the different types of stress communication and listening. We expected that more satisfied couples would show more contingent listening, thus stronger associations between one partner talking about the stress and the other listening in the same moment when correcting for verbal coping that might be shown instead of listening. The study is thus based on the assumption that emotion-oriented stress communication is important and that more satisfied couples usually show more responsiveness (Reis, 2014) and dyadic coping (e.g., Bodenmann, 2000).

9.

STUDY I

Zooming in: Couples' Dyadic Coping Conversations after Experimentally Induced Stress

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Abstract

Growing evidence that social support in times of stress is crucial for well-functioning relationships raises important questions about how intimate partners elicit specific forms of supportive behavior. To explore the process of support elicitation, we exposed either the male or female partner in a relationship to a standardized laboratory stressor (N = 127 couples), videotaped their subsequent reunion, and then coded those interactions at a micro-analytic level to investigate links between expressions of stress and partner responses to those expressions. Multilevel analyses indicated that the type of stress expression[5] served as a cue for the dyadic coping reaction of the partner. For example, problem-oriented stress expression within a 10s-interval of the conversation was strongly linked to problem-oriented dyadic coping in the same or following time sequence, while emotion-oriented stress expressions were associated with emotion-oriented dyadic coping reactions. These findings enhance the understanding of the link between different stress expressions and dyadic coping reactions and offer important implications for couple interventions.

Keywords: within-couple processes, stress, dyadic coping, couple relationships, sensitivity

[5] The term “stress expression” represents the same concept as “stress communication”

Introduction

Coping with stress together as a couple is important for the maintenance of a healthy and satisfying relationship (Bodenmann, Pihet, et al., 2006; Falconier et al., 2015). To be able to provide the most effective support in stressful times, partners have to match their supportive behavior to the stressed person's needs. Effective support is most likely when the stressed partner expresses his or her stress in an appropriate, unambiguous way, thereby enabling the partner to correctly perceive these stress signals and respond to them in accordance to the speaker's needs (Bodenmann, 2007; Cutrona, 1996; Cutrona & Russell, 1990; Rafaeli & Gleason, 2009). If the support should be perceived as well-intentioned and useful, it should be appropriate not only in content but also in timing (Bodenmann, 2005; Neff & Karney, 2005). As the literature on interpersonal sensitivity indicates, promptness is an important factor in the process of emotional regulation (e.g., Henning & Striano, 2011): whereas an immediate response to an expression of stress can indicate empathy and concern, the same response delivered after a delay can come across as abrupt or inappropriate and thus as failing to meet the stressed partner's needs (Bodenmann, 2005). Although diary studies successfully exploit repeated self-reports to clarify support provision in relationships (e.g., Laurenceau et al., 1998; Repetti, 1989), exchanges involving expressions of stress and responses to those expressions might be brief and fleeting, suggesting the need to study these processes directly as they unfold within real-time interactions. The present study does so, using a standardized stress-induction procedure to ensure that experiences of stress are relatively uniform across couples.

The Systemic Transactional Model (STM; Bodenmann, 1995b, 2005) offers an important perspective for studying stress communication and support in relationships. The STM posits that adequate communication of stress, and the response of the partner, are important for the stress regulation process on an individual and dyadic level, fostering in turn well-being for the partners individually and satisfaction for the couple. According to the STM, the supportive partner must perceive and decode the stressed partner's signs of stress, which is facilitated by a clear stress expression. For example, when feeling sad after an unjustified criticism by a colleague at work, one might better be able to deal with these emotions if one's spouse shows emotional understanding and support rather than giving practical advice. However, empathic understanding of this sort is more likely when the stressed partner talks about his or her feelings and tells the other what bothers him or her. Talking merely about facts with no stress-related self-disclosure is often followed by problem-oriented support of the partner (Bodenmann, 2000). Sensitive responses to the partner's stress signals and needs

are believed to be critical for higher intimacy and mutual bonding (Bodenmann, 2005; Laurenceau et al., 1998; Reis & Shaver, 1988).

Stress and Dyadic Coping in the Systemic Transactional Model

The STM describes a transactional process of stress expression and support provision or joint dyadic coping (DC) processes involving both partners in an intimate relationship. DC has consistently been identified as a significant predictor of marital satisfaction and stability (Bodenmann, 2005; Falconier et al., 2015).

Stress expression. In the STM (Bodenmann, 1995a, 2000; Bodenmann & Perrez, 1991), stress can be expressed verbally or nonverbally, and those expressions can be problem- or emotion-oriented. Problem-oriented stress expression is often expressed verbally, such as asking one‘s partner for practical advice or tangible assistance, whereas emotion-focused stress may be communicated verbally or nonverbally, reflecting one’s emotional state. The latter is not necessarily intentional. For example, one partner can express his or her emotional stress without aiming to mobilize the other partner's engagement in DC, while this is more often the case in problem-oriented stress expression where the help of the partner is required. Often, emotional expression of stress is a manner of telling the partner about personal worries, negative experiences, and embarrassment with no clear purpose of support seeking. Nonverbal stress communication includes voice tone, sighs, or facial expressions (Bodenmann, 2005). Emotion-oriented stress-related self-disclosure includes implicit or explicit expressions of one’s mood, emotions, and bothersome cognitions or an explicit request for assistance. Implicit stress expression can take the form of talking about the stressful situation by addressing a vague unpleasant experience, but without talking about concrete feelings (e.g., “I had a bad day”). Explicit stress expression is characterized by talking about concrete emotions (e.g., “I have never been that embarrassed”; “I feared that I would not be able to do this well”; “I was sad that this happened”), or an explicit request for support by the partner (“I feel so sad about that, I need you now”).

Dyadic coping. The partner may or may not perceive and react to these stress expressions. DC reactions can be verbal or nonverbal, positive or negative, and they can focus on problem-solving or emotion regulation in order to support the stressed partner or to cope together with stress. *Problem-oriented supportive DC* is defined as helping to resolve practical components of a stressor, giving advice, suggesting solutions, or taking over tasks in order to alleviate stress for the partner. *Emotion-oriented supportive DC* includes empathic understanding, active and interested listening, caring, reassurance or encouragement as well as showing solidarity with the partner. It also includes reassuring nonverbal behaviors such as

touching the partner (e.g., hugging, holding, kissing, giving a massage). DC can also be *negative* when partners react in a hostile (e.g., blaming the partner for his or her stress management), ambivalent (e.g., unwillingness to support him or her), or superficial way (e.g., lack of real motivation to support). These negative forms of DC occur, for example, when the listening partner is not motivated or committed (e.g., low relationship satisfaction) or has poor personal resources (e.g., being stressed him-/herself, lack of an adequate DC skills).

Linking Stress Expression with Dyadic Coping

In principle, stress-related self-disclosures facilitate a deeper and better understanding by the partner, allowing him or her to provide adequate support that corresponds to the needs of the stressed partner (Bodenmann, 2005; Cutrona & Russell, 1990). According to the Optimal Matching Model (Cutrona & Russell, 1990) and the Social Support Effectiveness Model (Rini & Dunkel-Schetter, 2010), provided support is most beneficial when it matches the partners' needs (S. Cohen & Wills, 1985; Cutrona et al., 2007). Along similar lines, the STM assumes that a more explicit stress expression enables the partner to gain a deeper understanding of the emotions and needs of the stressed partner, and that this empathic understanding subsequently allows partners to feel connected and to strengthen their sense of mutual trust and intimacy (Bodenmann, 2005; Cutrona, 1996). This reasoning is in line with the intimacy process model (Reis & Shaver, 1988) which states that self-disclosure leads to more intimacy when the other partner is able to convey a feeling of understanding, validating, and caring for the stressed partner (see also Laurenceau et al., 1998). In short, adequate support in intimate relationships requires an appropriate stress communication that might be particularly important for emotional stress experiences.

Gender Differences

Past research suggests that stress expression differs between men and women (Bodenmann et al., 2015; Dindia & Allen, 1992), whereas gender differences in support reactions are less consistently reported (Donato et al., 2015). Research has reported similar effects for the amount and type of social support for men and women (L. J. Roberts & Greenberg, 2002; Sullivan et al., 2010), however, men and women differ in support provision when they are stressed themselves, with stressed men being less able to provide adequate support (Bodenmann et al., 2015). Studies on matching and the adjustment over time have shown that women tend to be more likely to respond with emotional support to emotional self-disclosures than men (Cutrona et al., 2007; Neff & Karney, 2005). As noted below, we aim to build on this finding in the present study.

Current Study

In the current study, we focus on the within-couple associations between one partner's stress expression and the other partner's DC to examine whether partners alter their DC reaction according to the form of their partner's stress expression. For the analysis, we used data from an experimental study with a non-clinical sample of satisfied couples in which either the woman (experimental condition 1) or the man (experimental condition 2) was stressed by means of the Trier Social Stress Test (TSST; Kirschbaum et al., 1993). Couples' interactions were videotaped during the reunion with their partner after the stress induction and were subsequently micro-analytically coded. Using observational data overcomes possible response biases associated with self-report data, and approaching these observed conversations at a micro-analytic level overcomes limitations associated with aggregating data either over partners or across relatively long spans of time. We adopted this level of analysis under the assumption that fluctuations and micro-processes could give valuable insights into underlying mechanisms of support, and with the reasoning that investigating behavioral sequences rather than base rates can yield information about the underlying processes that govern interactions involving stressed partners (see e.g., Johnson & Bradbury, 1999).

We hypothesize that the stressed partner's type of stress expression (problem- vs. emotion-oriented) should pave the way for a corresponding, time-contingent DC reaction on the within-couple level as suggested by the STM. For example, problem-oriented stress expression might serve as a stronger cue than emotion-oriented stress expressions for the partner to respond with problem-oriented DC (and vice versa). Hence, partners' DC is assumed to be continually adjusted to the corresponding stress expression. At the same time, partners' DC responses can also be maladaptive (i.e., negative DC), either due to depleted coping resources, a lack of motivation or skills to support the partner effectively, or because the stress expression was ambiguous. To control for the general level of stress expression, we also investigate parallel effects on the between-couple level, attempting to replicate previous findings (e.g., Cutrona et al., 2007). Based on previous research reporting gender differences in adjusting support provision, we expected women to react more strongly, i.e., with a higher likelihood, to emotion-oriented stress expressions than men would.

Method

Participants

The sample consisted of 127 heterosexual couples who were recruited by advertisements in newspapers, magazines, and internet sites. All couples had to meet the following inclusion criteria: (a) willingness of both partners to participate, (b) stable and committed heterosexual relationship for at least 12 months, and (c) both partners aged between 20 and 45 years. Additionally, both partners had to communicate in German for the purposes of observational coding. Exclusion criteria for participation were chronic mental or physical illness, medication, and prior participation in the TSST (Schommer, Hellhammer, & Kirschbaum, 2003).

Average age for women was 26.0 years (*SD* = 5.5) and for men 28.2 years (*SD* = 6.2). Most participants (57% of the women and 47% of the men) were in continuous education, mostly at university. Average relationship length was 4.5 years (range 1 – 19 years, *SD* = 3.6). Half of the couples were cohabitating, and 18% were married. Most of the couples had no children (87%). On a 5-point index of relationship quality (Hendrick, 1988), participants' average score was 4.4 (*SD* = 0.4), which indicates high relationship satisfaction. Couples in the two conditions did not differ with regard to all demographic characteristics ($F = 1.601$, $p = .208$).

Procedure

Extra-dyadic stress was induced by using the Trier Social Stress Test (Kirschbaum et al., 1993), a widely used standardized and well established stress procedure (for an overview, see Dickerson & Kemeny, 2004). Sessions took about 2.5 hours. In 64 couples the woman was randomly chosen to be stressed and in 63 couples the man was randomly chosen to be stressed. Participants were informed about the study procedure but did not know in advance which of the partners would receive the TSST. After a brief introduction of the study, both partners signed an informed consent before they completed a first set of questionnaires. Before and after the stress induction, couples were left alone in a separate room for 8 minutes while their conversation was videotaped. The room was equipped with a couch and small table with an informal, comfortable setting to allow for a free, unstructured interaction between the partners. Couples were asked to remain seated and did not receive further instructions. While the TSST was conducted in a separate room, the partner waited in the observation room.

Following the standard protocol, the TSST involved a free speech (4 min) and mental arithmetic (4 min) task. Participants were given 5 min to prepare for a mock job interview.

They were told that they would have to present themselves in front of an evaluative audience with expertise in analyzing nonverbal behavior. In addition, a video camera was directly pointing to the participant. The audience was instructed to maintain neutral facial expressions and to provide only brief, neutral, and distant reactions. Participants had to talk about their strengths and qualification for the job and were asked questions such as "Why do you think you should get this job?". For the subsequent 4-min oral arithmetic task, participants serially subtracted 17 from 2,043 as quickly as possible. After any mistake, they were interrupted and asked to start again from the beginning. Couples reunited after the TSST and were asked again to remain seated and wait "while investigators checked whether all data were properly recorded and can be used for analyses", so that the second 8-min interaction could be videotaped. The second interaction was thus similar to the first one but differed that partners (depending on group) had been stressed. Again, partners were not specifically instructed what they should talk about. Finally, couples received a debriefing and were given an incentive of $100. The study procedures were approved by University of Zurich Institutional Review Board.

Measures

Observed stress expression and dyadic coping. We used a well-established coding system (SEDC; System for assessing observed dyadic coping; Bodenmann, 2000) to code five forms of stress expression and four forms of verbal DC in the interactions occurring before and after the TSST. For the purpose of the current study, only the data of the second interaction phase that took place after the stress induction for one of the partners were analyzed. A manipulation check comparing the two conversations before and after the stress induction revealed significant increases in stress expression of the stressed partner and DC of the non-stressed partner for the two experimental groups.

Stress expression of the stressed partner. Stress expression was coded using five categories: *verbal problem-oriented stress expression* (e.g., asking the partner for advice or specific assistance), *nonverbal stress expression* (e.g., sighing, restlessness, whiny voice), *neutral stress expression* (neutral or factual descriptions of what happened during the TSST), and verbal emotional self-disclosures including *implicit stress expression* (e.g., superficial feelings such as "stressed" or "frustrated" or self-scrutinizing) and *explicit stress expression* ("I have never been that embarrassed" or "I was really hurt by that person's behavior"). Because base rates for explicit stress expression were extremely low (0.2% - 14 out of 6096 sequences), implicit and explicit stress expressions were collapsed into one category (verbal emotion-oriented stress expression).

Dyadic coping of the non-stressed partner. We assessed DC including *problem-oriented DC* (giving advice, assistance), *emotion-oriented DC* (validating partner, helping to re-evaluate the situation, or showing understanding and respect, as well as nonverbal behavior such as supportively touching or kissing the partner) and *negative DC* that included all support behaviors that were hostile, ambivalent, dismissive, or superficial.

Stress expression and DC behaviors were coded at 10-s intervals by independent, thoroughly trained coders, blind to study hypotheses. For each couple, one observer coded the woman's behavior, and the other observer simultaneously coded the man's behavior. Coders were instructed to code for the presence (= 1) versus absence (= 0) of these behaviors. Ten percent of the tapes were re-coded by independent observers, and interrater-reliability was Cohen's $\kappa = .78$ for stress expression and .87 for DC reactions. Conversations lasted 8 minutes so that the resulting dataset contained 48 sequences with a dummy-coded 10s-interval each.

Statistical Analyses

The goal of this study was to examine the stress-coping process on a micro-analytic level during a couple conversation. We conducted series of multilevel models to investigate how stress expression and DC are linked during every sequence of the conversation but also how couples may differ in general in their DC reaction following certain stress expressions. We thus differentiate between a within-couple (Level 1) and a between-couple level (Level 2).

We estimated three multilevel models for the different forms of verbally active DC (problem-oriented DC, emotion-oriented DC, and negative DC) as outcomes. Multilevel analyses calculate the association between predictor and outcome within each sequence. As coping reactions might occur delayed (lagged) to a stress expression considering the short sequence interval of only 10 seconds, we accounted for this lag effect by creating an outcome variable that combined the DC reaction and - at the same time - accounts for the DC reaction that occurs one sequence later. We first created a 1-lag variable of the DC reaction and combined it with the non-lagged dummy coded DC variable so that if a coping reaction occurred in the 10s-sequence after the sequence in which the stress expression had occurred, the combined variable would now indicate a coping reaction (coded as 1) in the same sequence.

Within- and between-couple variables. Following recommendations of Bolger and Laurenceau (2013), we decomposed effects for the different stress expressions into two separate predictors reflecting within- and between-couple variation. As within-couple

predictors, the dummy scores were used. We did not center these dummy scores to ease interpretation. To correct for the overall level of each stress expression, the centered mean scores of every stress expression per couple were used as between-couple predictors. First, we calculated the mean score per person and then subtracted the overall mean to center the variable. Hence, on the within-couple level, for every stress expression during a certain 10s-sequence where the behavior (coded as 1) occurs, we investigate the effect of the coping reaction from the partner during the same 10s-sequence (using the combined non-lagged and lagged outcome variable).

We used the following baseline equation:

$Coping_{it} = \beta_{0i} + \beta_1(\text{gender}) + \beta_2(\text{sequence}) + \beta_3(\text{problem-oriented stress expression}_{within}) + \beta_4(\text{nonverbal stress expression}_{within}) + \beta_5(\text{neutral stress expression}_{within}) + \beta_6(\text{emotion-oriented stress expression}_{within}) + \beta_7(\text{problem-oriented stress expression}_{between}) + \beta_8(\text{nonverbal stress expression}_{between}) + \beta_9(\text{neutral stress expression}_{between}) + \beta_{10}(\text{emotion-oriented stress expression}_{between}) + u_{0i} + r_{it}$

$Coping_{it}$ is the predicted outcome (e.g., problem-oriented DC) for subject i on time sequence t; β_{0i} represents the overall intercept at the beginning of the conversation, β_1 represents the main effect for gender of the partner providing dyadic coping behavior; β_2 represents the main effect for the time sequence; $\beta_{3\text{-}6}$ indicate the difference in dyadic coping per time sequence given the stress expression was present in comparison to when it was not present; $\beta_{7\text{-}10}$ reflect the average difference between couples in DC for a 1-unit increase in each of the four stress expressions; u_{0i} is the random effect of the intercept specific to subject i representing the variation between subjects in average DC, and r_{it} is the residual specific to time t for subject i.

To examine whether gender moderated the effects, in addition to the main effects, we also included interaction terms of stress expression and gender (stress expression*gender) on the within- and between-couple level. Model comparisons revealed that including the interaction terms did not improve model fit compared to the main effects only model (see Singer & Willett, 2003). Hence we only report the results of those final models[6]. Gender was dummy coded (0 = women, 1 = men) such that the intercept reflected the female DC behavior when the male partner was stressed. Time was coded such that the intercept reflects the start of the conversation and a 1 unit increase represents one 10 second sequence.

[6] We conducted additional analyses with contextual variables such as relationship length, cohabitation and current and chronic stress of the supporting partner as moderating variables. A comparison of the model fit indices of the moderation models with the models reported in the article favored the more parsimonious models.

Results

Preliminary Analysis

Our sample includes 64 stressed women and 63 stressed men, both taking part in an 8-min conversation (48 sequences) with their partner. In total, we thus have 6,096 observations (64 women stressed x 48 sequences = 3,072 observations, and 63 men stressed x 48 sequences = 3,024 observations). Table 1 presents the means and standard deviations of the mean amount of stress expression and DC behaviors that were observed during the 48 sequences of the conversations for the two conditions. Neutral stress expression, for example, occurred in about 16.14 - 20.42 of the 48 sequences for men and women, respectively. For most of the stress expressions, there were significant differences between men and women. Stressed women showed significantly more problem-oriented, neutral and emotion-oriented stress expressions than stressed men. Men provided more emotion-oriented DC and more negative DC. The intra-class correlations (ICC) was .47 on average (problem-oriented DC: .36, .44; emotion-oriented DC: .22, .29; negative DC: .61, .87 for men's and women's DC, respectively), which implies that most of the variance was within rather than between individuals. Negative DC seems to have more consistency within couples.

Figure 7 depicts the plots showing the four different response patterns for the stress expressions and DC reactions for men and women separately. When problem-oriented stress expressions are coded, problem-oriented DC is coded more often than emotion-oriented and negative DC. In only eight instances of all observations, negative or emotion-oriented DC was coded in the same sequence as problem-oriented stress expression. For non-verbal stress expressions, emotion-oriented DC seems to occur more often than the other DC reactions. The plots of the neutral stress expressions generally show that DC reactions are being coded indistinctively whether neutral expressions were coded as well or not. Emotion-oriented stress expressions are similarly, though less clearly, linked with emotion-oriented DC as are problem-oriented stress expressions with problem-oriented DC. In sum, the results of the descriptive statistics suggest that even though men and women differ in how often they express stress or engage in specific forms of DC, response patterns are similar for both genders.

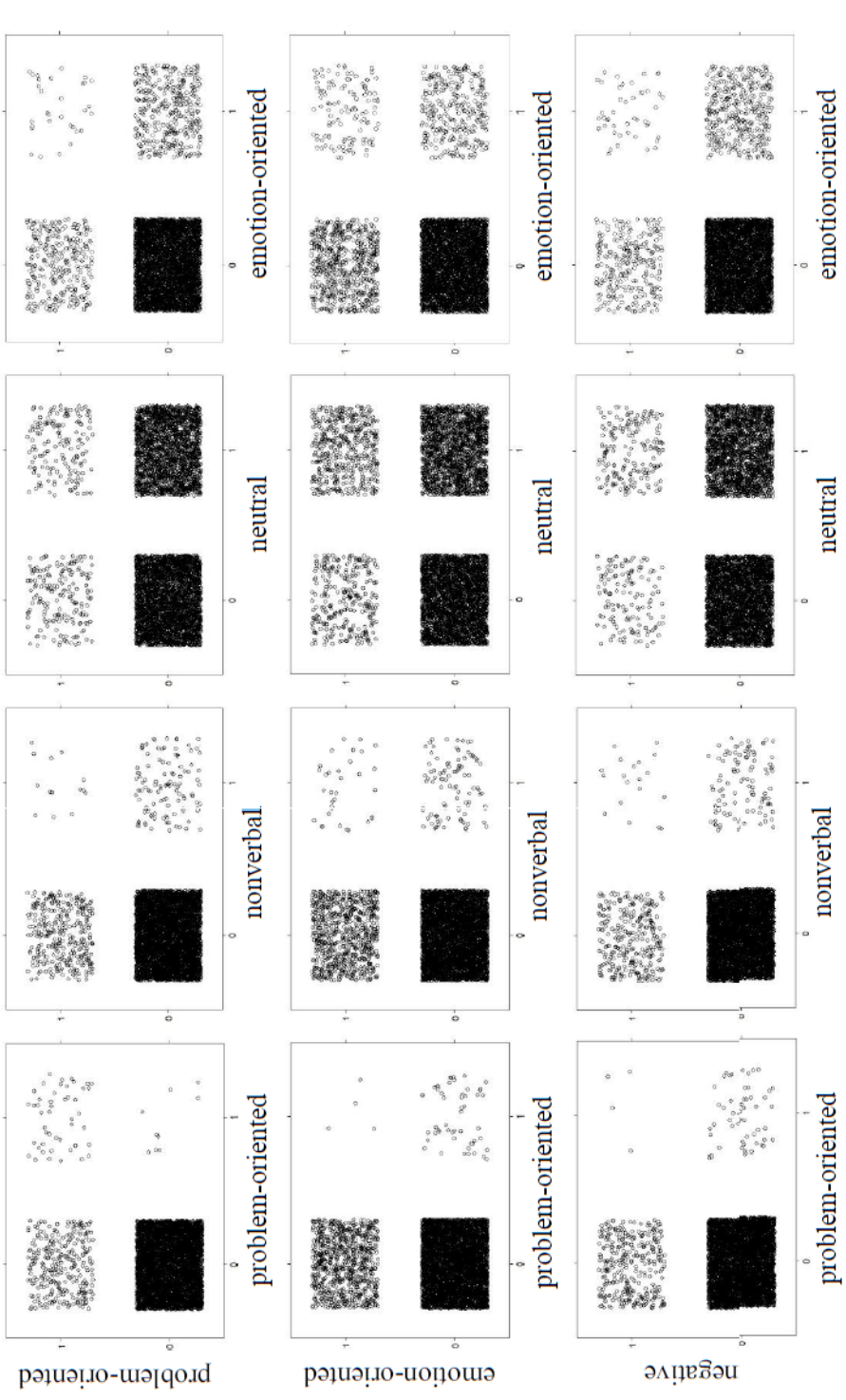

Figure 7. Plots showing the four different response patterns for each of the stress expressions and dyadic coping reactions

Table 1. *Means, T-Test, and Intercorrelations for the Within- and Between Variables of the different Types of Stress Expression and Dyadic Coping*

	Within-Couple (N = 6,096 in total)						
Stress Expression	1	2	3	4	5	6	7
Problem-oriented (1)	-	-.019	-.099**	-.034	.371**	-.026	.003
Nonverbal (2)	-.009	-	-.141**	-.049**	.002	.042*	.078**
Neutral (3)	-.052	-.085	-	-.256**	.006	.169**	.081**
Emotion-oriented (4)	-.017	-.028	-.168**	-	.036*	.131**	.067**
Dyadic Coping							
Problem-oriented (5)	.277**	.088**	.082**	.008	-	-.013	-.040*
Emotion-oriented (6)	-.007	.079**	.183**	.127**	-.019	-	-.058**
Negative (7)	.012	.039*	.100**	.071**	-.034	-.021	-
	Between-Couple (N = 64 women stressed, 63 men stressed)						
Stress Expression	1	2	3	4	5	6	7
Problem-oriented (1)	-	.194**	.157**	.070**	.712**	-.009	.068**
Nonverbal (2)	.411**	-	.011	.343**	.107**	.145**	.444**
Neutral (3)	.272**	.304**	-	.121**	.298**	.405**	-.015
Emotion-oriented (4)	.058**	.180**	.381**	-	.121**	.446**	.258**
Dyadic Coping							
Problem-oriented (5)	.665**	.401**	.525**	.270**	-	.263**	-.019
Emotion-oriented (6)	.052**	.284**	.512**	.347**	.182**	-	-.231**
Negative (7)	.111**	.307**	.056**	.231**	.186**	-.116**	-

	Women's stress conversation	Men's stress conversation	
Stress Expression	*M (SD)*	*M (SD)*	*t (df* =125*)*
Problem-oriented	0.63 (1.20)	0.25 (0.65)	-2.171*
Nonverbal	1.25 (1.91)	0.68 (1.28)	-1.963
Neutral	20.42 (7.82)	16.14 (6.30)	-3.398*
Emotion-oriented	3.91 (3.14)	2.52 (2.41)	-2.780*
Dyadic Coping	*M (SD)*	*M (SD)*	*t (df* =125*)*
Problem-oriented	1.66 (2.37)	1.40 (2.09)	0.653
Emotion-oriented	4.17 (3.64)	2.46 (2.81)	2.978*
Negative	1.84 (2.87)	0.94 (2.05)	2.054*

Note. Above the diagonal women's stress conversations (women's stress expression, men's coping) are displayed, below men's stress conversations (men's stress expression, women's coping) are displayed. Means represent the average amount of sequences across the conversation for when the behavior was coded as 1 (out of 48 sequences). Dyadic coping is displayed by the raw scores and not the combined variable. *p < .05, **p < .01

Below we present results separately for each form of DC using the combined variable including the DC reaction 10s later with the four different stress expressions as predictors[7] on the within- and between-couple level. We compared random intercept models with models that included a random intercept and a random slope with model fit indices of chi-square tests (see Singer & Willet, 2003). For all the three models, random intercept models fit the data best. There were no significant time trends over the sequences of the conversation in any of the models.

Problem-Oriented Dyadic Coping

Table 2 shows the results of the generalized linear mixed model for problem-oriented DC as a function of the four different stress expressions of the partner. On the within-couple level, all four stress expressions were significantly associated with problem-oriented DC. In comparison to the other stress expressions, problem-oriented stress expression shows much stronger associations with problem-oriented DC. The substantial difference in the odds ratio (OR) shows that the probability for concurrent and lagged problem-oriented DC was almost 120 times greater when problem-oriented stress expression was observed during the sequence compared to when the partner did not express problem-oriented stress. On the between-couple level, higher problem-oriented and neutral stress expressions were related to more problem-oriented DC. Similar to the within-couple level, problem-oriented stress expression shows very strong associations with the outcome. Thus, partners expressing higher problem-oriented stress throughout the entire conversation than the average of our sample received more problem-oriented DC from their supporting partners.

[7] We additionally ran models without explicit stress expression, only including implicit stress expression. The only difference in significance was observed for the model with emotion-oriented coping where the between-person implicit stress expression was significant ($\beta = 3.41$, $p = .044$).

Table 2. *Generalized Linear Mixed Model: Problem-Oriented DC as a Function of the Four Different Stress Expressions*

			CI_{95} for Estimate			
Fixed effects (intercepts, slopes)	Estimate	(SE)	Lower	Upper	*p*	OR
Intercept	-3.780	0.247	-4.265	-3.296	<.001	0.02
Sequence	0.005	0.005	-0.005	0.015	.349	1.00
Gender	-0.415	0.254	-0.914	0.083	.103	0.66
Partners‘ Stress expression						
Level-1 (within-couple)						
Problem-oriented	**4.788**	**0.431**	**3.944**	**5.631**	**<.001**	**120.00**
Nonverbal	**1.145**	**0.345**	**0.469**	**1.822**	**<.001**	**3.14**
Neutral	**0.650**	**0.166**	**0.326**	**0.975**	**<.001**	**1.92**
Emotion-oriented	**0.808**	**0.247**	**0.324**	**1.291**	**.001**	**2.24**
Level-2 (between-couple)						
Problem-oriented	**21.645**	**5.439**	**10.984**	**32.306**	**<.001**	**$2.5*10^9$**
Nonverbal	-2.154	3.778	-9.558	5.251	.569	0.16
Neutral	**3.011**	**0.886**	**1.274**	**4.747**	**.001**	**20.03**
Emotion-oriented	0.780	2.146	-3.426	4.985	.716	2.18
Random effects	Variance					
Intercept	1.031					
R^2 (%)	50.53					

Note. N = 127, 48 sequences (6,096 observations). SE, standard errors; CI_{95} for Estimate, 95% confidence interval; OR = odds ratio. Gender is dummy coded with 0 = women's coping behavior and 1 = men's coping behavior. R^2 represents the proportional reduction in the variance of the intercepts and is computed based on recommendations of Raudenbush and Bryk (2002) $R^2 = (\hat{\tau}_{00b} - \hat{\tau}_{00f})/\hat{\tau}_{00b}$, where $\hat{\tau}_{00b}$ = the estimated variance of the intercepts in the base model and $\hat{\tau}_{00f}$ = the estimated variance of the intercepts in the fitted model.

Emotion-Oriented Dyadic Coping

Table 3 shows the results for concurrent and lagged emotion-oriented DC as the outcome. On the within-couple level, higher nonverbal, neutral and emotion-oriented stress expressions per sequence were related to more emotion-oriented DC. Only problem-oriented stress expression was not significant. This indicates that during sequences with any of these three stress expressions, compared to no or problem-oriented stress expression, the likelihood of receiving emotion-oriented DC increased significantly. On the between-couple level, results revealed that partners who used neutral stress expressions above the sample average throughout the conversation had higher likelihoods of receiving emotion-oriented DC. Emotion-oriented stress expressions were only marginally significant.

Table 3. *Generalized Linear Mixed Model: Emotion-Oriented DC as a Function of the Four Different Stress Expressions*

			CI_{95} for Estimate			
Fixed effects (intercepts, slopes)	Estimate	(SE)	Lower	Upper	*p*	OR
Intercept	-3.309	0.189	-3.679	-2.938	<.001	0.04
Sequence	-0.004	0.003	-0.011	0.003	.263	1.00
Gender	0.308	0.196	-0.077	0.693	.117	1.36
Partners‘ Stress expression						
Level-1 (within-couple)						
Problem-oriented	0.418	0.546	-0.651	1.488	.443	1.52
Nonverbal	**1.823**	**0.249**	**1.336**	**2.313**	**<.001**	**6.20**
Neutral	**1.493**	**0.120**	**1.257**	**1.729**	**<.001**	**4.45**
Emotion-oriented	**1.926**	**0.160**	**1.613**	**2.240**	**<.001**	**6.86**
Level-2 (between-couple)						
Problem-oriented	-5.472	4.650	-14.586	3.642	.239	0.00
Nonverbal	1.135	2.779	-4.352	6.621	.685	3.11
Neutral	**1.816**	**0.658**	**0.526**	**3.106**	**.006**	**6.15**
Emotion-oriented	3.062	1.629	0.131	6.254	.060	21.36
Random effects	Variance					
Intercept	0.760					
R^2 (%)	39.32					

Note. N = 127, 48 sequences (6,096 observations). SE, standard errors; CI_{95} for Estimate, 95% confidence interval; OR = odds ratio. Gender is dummy coded with 0 = women's coping behavior and 1 = men's coping behavior. R^2 represents the proportional reduction in the variance of the intercepts and is computed based on recommendations of Raudenbush and Bryk (2002) $R^2 = (\hat{\tau}_{00b} - \hat{\tau}_{00f}) / \hat{\tau}_{00b}$, where $\hat{\tau}_{00b}$ = the estimated variance of the intercepts in the base model and $\hat{\tau}_{00f}$ = the estimated variance of the intercepts in the fitted model.

Negative Dyadic Coping

Table 4 shows that on the within couple level, the likelihood of a negative DC response in a sequence where there was a nonverbal stress expression was 4.39 times higher compared to when there was no nonverbal stress expression. Neutral and emotion-oriented stress expressions elicited negative DC to a similar extent. Interestingly, problem-oriented stress expression was not associated with significantly higher negative DC. On the between-couple level, none of the stress expressions proved to be significant predictors for negative DC. This means that, on average, participants, whose partners expressed more (or less) stress throughout the entire conversation (irrespective of the kind of stress expression) did not provide more (or less) negative DC.

Table 4. *Generalized Linear Mixed Model: Negative DC as a Function of the Four Different Stress Expressions*

			CI_{95} for Estimate			
Fixed effects (intercepts, slopes)	Estimate	(SE)	Lower	Upper	*p*	OR
Intercept	-5.442	0.420	-6.266	-4.618	<.001	0.00
Sequence	-0.001	0.005	-0.012	0.009	.780	1.00
Gender	0.687	0.524	-0.340	1.714	.190	1.99
Partners‘ Stress expression						
Level-1 (within-couple)						
Problem-oriented	1.023	0.583	-0.120	2.166	.079	2.78
Nonverbal	**1.531**	**0.328**	**0.888**	**2.174**	**<.001**	**4.62**
Neutral	**1.481**	**0.178**	**1.133**	**1.829**	**<.001**	**4.40**
Emotion-oriented	**1.599**	**0.238**	**1.132**	**2.065**	**<.001**	**4.95**
Level-2 (between-couple)						
Problem-oriented	2.023	12.304	-22.092	26.138	.869	7.56
Nonverbal	11.883	7.171	-2.173	25.938	.098	145000.00
Neutral	-2.024	1.770	-5.493	1.444	.253	0.13
Emotion-oriented	2.724	4.398	-5.897	11.344	.536	15.20
Random effects	Variance					
Intercept	5.107					
R^2 (%)	14.36					

Note. N = 127, 48 sequences (6,096 observations). SE, standard errors; CI_{95} for Estimate, 95% confidence interval; OR = odds ratio. Gender is dummy coded with 0 = women's coping behavior and 1 = men's coping behavior. R^2 represents the proportional reduction in the variance of the intercepts and is computed based on recommendations of Raudenbush and Bryk (2002) $R^2 = (\hat{\tau}_{00b} - \hat{\tau}_{00f})/\hat{\tau}_{00b}$, where $\hat{\tau}_{00b}$ = the estimated variance of the intercepts in the base model and $\hat{\tau}_{00f}$ = the estimated variance of the intercepts in the fitted model.

Discussion

The goal of the current article was to examine the theoretical assumptions of the STM (Bodenmann, 1995a, 2005) by using observational data of stress communication and dyadic coping (DC) on a micro-analytical level. The STM posits that perception and decoding of stress signals are crucial for an adequate DC reaction, which implies that the stress expression should be clear and non-ambiguous. We thus investigated the association between different forms of stress expression and DC reactions of the partner on a within- and between-level. Results generally confirmed our hypotheses that partners adjust their supportive behavior according to the form of stress communication displayed by their partner during the videotaped discussions.

More specifically, problem-oriented DC was strongly associated with problem-oriented stress expression. As also seen in previous studies, it seemed easier for couples to react with practical support after factual, problem-oriented stress expressions than to emotion-oriented stress expressions (Bodenmann, 2000; Cutrona et al., 2007). Thus, partners

expressing problem-oriented stress in one sequence (within-couple), as well as partners who were generally higher than the average (between-couple), had a higher likelihood of receiving problem-oriented DC than partners expression emotion-oriented stress. This may have two reasons. First, problem-oriented stress expression is easier to perceive and decode, whereas emotion-oriented stress expression is often more ambiguous and harder to interpret correctly (Bodenmann, 2005). Second, problem-oriented DC might be easier to provide as it usually includes practical tasks or advice. Emotion-oriented DC, on the other hand, is more demanding, and depends more on both partners' moods and resources, such as the current emotional availability. Partners might be less skilled in emotional support provision, out of fear that they may react inadequately or because they do not know what exactly would be beneficial for the partner to help him or her regulate his or her emotions.

On the other hand, emotion-oriented DC was not associated with problem-oriented stress expression, indicating that partners are able to distinguish between both forms of stress expression and the required DC action. Emotion-oriented DC was observed after nonverbal, neutral, and emotion-oriented stress expression on the within-couple level. Couples also had a higher likelihood of showing emotion-oriented DC when the mean level of neutral stress expression was higher. For emotion-oriented stress expression, the association was marginally significant. Interestingly, partners seem to react similarly to rather ambiguous signals (nonverbal and neutral stress expressions) than to emotion-oriented stress expressions. Couples might be generally accustomed to less explicit stress signals in daily life, or the listening partner's mere knowledge that the other partner had been stressed by the experiment motivates him or her to provide emotional support. Emotion-oriented stress expressions, however, had a higher likelihood of eliciting emotion-oriented DC than the other types of stress expression, which is in line with predictions of STM.

The likelihood of negative DC was higher in relation to nonverbal, neutral and emotion-oriented stress expression compared to no or problem-oriented stress expression. Usually, one would expect a positively supportive partner when talking more emotionally about experienced emotions. For partners who have lower levels of trust and reciprocal respect, however, showing vulnerability might trigger negative DC (see also Cutrona et al., 2007). The non-stressed partner might also not have fully understood what the stressed partner had experienced, and why this was so important and stressful as it was only a non-relevant experimental stress situation with no further meaning for the partner or the couple's life. As a consequence, the partner's DC might have been less empathic and more ambivalent

or superficial. This may be different in real life, when the reported stress seems to have a more relevant impact.

In addition, implicit emotion-oriented expressions act less as a clear clue of how to provide support compared to factual problem descriptions. Sending cues such as sighing (nonverbal stress expression), explaining what happened during the stressful experience (neutral stress expression) or stating that one is stressed (implicit stress expression) might show substantial overlap with indirect support seeking (e.g., Barbee & Cunningham, 1995; Don, Mickelson, & Barbee, 2013). Research hints at the possibility that indirect support seeking, including nonverbal stress communication, can backfire and provoke negative responses (Barbee & Cunningham, 1995), which could explain the positive associations between nonverbal, neutral as well as the mainly implicit emotion-oriented stress expression and the partner's negative DC. However, the pseudo-R^2 for negative DC is much lower than for problem- and emotion-oriented DC, which might indicate that negative DC could be influenced by many other factors (e.g., low relationship satisfaction, lack of motivation) than only the partner's stress expression during the conversation.

Although we did not find gender differences for the associations between the different types of stress expression and DC reactions, women generally had higher mean levels of stress expression, which is in line with findings from a meta-analysis by Dindia and Allen (1992). One possible explanation might be a heightened math anxiety in women (Maloney, Waechter, Risko, & Fugelsang, 2012). Kelly and colleagues (2008) found that women reported more fear, irritability, confusion and less happiness following the TSST than men do. The differential effects of the TSST might explain the finding of men providing more emotion-oriented DC. Together with the knowledge that their partner had just been stressed, men might have been encouraged to engage in more DC efforts.

Because we are analyzing DC reactions during the same sequence or in the subsequent sequence 10s later, our focus lies on the time-contingent link between stress expression and DC. Time contingency is considered as one factor that plays a role for adequate support. Collins, Ford, Guichard, Kane, and Feeney (2010) differentiate between the manner in which support is provided and the degree of time contingency with the partner's needs, such as responding promptly. Neff and Karney (2005) likewise suggest that it is not only sufficient knowing how to provide support, but also when and "how to continually adjust their support provision in response to a partner's changing difficulties" (Neff & Karney, 2005, p. 80). However, partners might not always be able to provide a prompt, adequate coping reaction but first need to reflect on what they have just heard as new information. Therefore,

sometimes we might observe a DC reaction, but it refers to a stress expression that had happened already some sequences ago. In addition, phases of stress expression might go on for several sequences. Future research should disentangle these timing processes in more detail.

Limitations and Future Directions

Our analysis is thus limited by the time-based 10s-coding. Event-based analyses might portray a clearer picture, particularly when it comes to contingent partner reactions and the duration of the different behaviors. Our analyses are more conservative because they only account for a DC reaction at the same or subsequent sequence. Second, assumptions about causality should be made with caution. Even though we included one 10s-lag in the outcome variable, we cannot exclude the possibility that, for example, emotion-oriented DC also leads to more emotional stress expressions insofar as the stressed partner may be encouraged by the supportive partner to continue his or her stress-related emotional self-disclosure. Third, because the conversation covered a time period of 8 minutes only, results might not be generalized to other couple contexts such as coping situations that unfold over a longer period of time or ultimately result in intra-dyadic conflict, which may limit the external validity of the findings. The TSST might thus not be able to represent all types of DC conversations. In daily life, couples may deal with different types of stressors including stressors that more directly affect both partners or spill over into the relationship. In such instances, the association between stress expression and DC might be different than in our analyses. Furthermore, partners in everyday life often face stressors at the same time, limiting their capacity to provide adequate support. For example, men's support quality decreased when they were stressed at the same time (Bodenmann et al., 2015). In addition, the laboratory stressor (including a mock interview and arithmetic tasks) might be different from stressful situations experienced in daily life with higher impact and greater significance. However, the different types of stress expression and DC reactions are most probably observed in real life as well (for a diary study see Xu, Hilpert, Nussbeck, & Bodenmann, 2016). Thus, although the stressor might be different for couples, the association between stress expression and DC might be similar. Lastly, generalizability might also be constricted to fairly satisfied, heterosexual Caucasian couples as those in our sample displayed high relationship satisfaction.

Despite these limitations, the study offers methodological strengths such as an experimental design with observational data and statistical analyses that go beyond the traditional static perspective in the stress and coping literature. By using a micro-analytic

approach, we were able to detect variations that cannot be investigated with traditional designs that use aggregated indicators. In addition, the differentiation between the different forms of stress expression and DC behavior provides a more detailed picture than does the often used more simplified distinction between problem- and emotion-oriented behaviors and allows us to explicitly test the assumptions of the STM in more detail.

Clinical Implications

Our findings might also be clinically relevant. As research suggests, emotional understanding seems to be crucial for adequate support processes (Bodenmann & Randall, 2012). If partners open up and disclose about their emotions, they are more likely to receive empathic understanding and reassurance from their partners. Stress-related emotional self-disclosure has the potential to increase intimacy and ultimately relationship satisfaction (Laurenceau et al., 1998). Although we find evidence for partners adjusting their support and matching it to the stress expression, people might not be very good at expressing their stress in a form that would enable the partner to provide the most suitable DC. Conversations often fail and end in withdrawal or conflict because of misunderstandings that are due to different ways of communication. Therefore, it would be important to teach couples how to provide adequate support and how to express their stress in a way that is less ambiguous and points more towards the actual needs of the stressed person. Such an approach is used in the 3-phase method within the Couples Coping Enhancement Training (CCET; Bodenmann & Shantinath, 2004) or coping-oriented couple therapy (Bodenmann & Randall, 2012). In addition to providing feedback on the DC reaction of the partner (third phase of the 3-phase method), couples should be trained in providing feedback on their stress expression in order to learn from each other how to communicate more clearly about stress-related emotions.

Clearer stress expressions enabling the partner to decode which behavior would be the most helpful might also counteract under- or overprovision of support (see Brock & Lawrence, 2009). Roberts and Levenson (2001) provide the example of an over-engaged partner that directly engages in problem-solving or encouragement when the stressed partner might simply need some time to relax. They describe this situation as a “cycle of well-meant, but misguided, support” even though it might match the stress expression. All these issues could be addressed in couple interventions. However, future studies should also include distressed couples or couples with mental disorders (e.g., depression, anxiety disorder) in order to detect differences on the micro-analytical level of the stress and DC process.

Conclusion

This study provides initial insights into the dynamics of support provision during conversations in which one partner is known to be stressed. Results provide empirical support for the STM on a micro-analytic level, showing that partners adjust their coping throughout the conversation. One key applied implication of this work is that intimate partners might benefit not only from learning how to provide support that is more responsive to one another's needs, but also from learning how to express their stress in ways that are less ambiguous and more likely to elicit the support they need.

10.

STUDY II

The Power of Listening: Lending an Ear to the Partner During Dyadic Coping Conversations

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Abstract

Despite its important role in couple communication trainings, listening in supportive conversations remains remarkably underexplored, albeit it represents a key factor in understanding the other partner's self-disclosure. In this study, micro-analytically coded listening behavior occurring during stress expression is analyzed using observational data of 365 couples talking about a stressful experience. On the basis of Actor-Partner Multilevel analyses, a listening score was calculated which was used in subsequent regression analyses as a predictor for dyadic coping behaviors during the conversation, the evaluation of the partner's dyadic coping in general, and relationship satisfaction. Analyses revealed that attentive listening while the other partner expresses stress is significantly linked with dyadic coping behaviors and relationship satisfaction. Partners displaying less listening behaviors during stress expression engage in more problem-oriented and negative dyadic coping. Our results highlight the relevance of listening for relationship functioning and its application in relationship education and couple therapy.

Keywords: listening, dyadic coping, couple conversation, multilevel

Introduction

Within the context of communication in intimate relationships, listening attentively to the partner's self-disclosure is commonly acknowledged as a core competence in research as well as in the clinical setting. During moments of self-disclosure, listening is a key factor for deeper understanding and intimacy as described in the intimacy process model (Reis & Shaver, 1988) and is thus crucial for providing adequate support (i.e., "dyadic coping"; Bodenmann, 2005). Evidence-based relationship education programs (e.g., CCET: Bodenmann & Shantinath, 2004; EPL: Hahlweg et al., 1998; Couple Care: Halford & Simons, 2005; PREP: Markman et al., 1993), as well as most approaches of couple therapy, therefore aim to strengthen self-disclosure and listening skills in couples. Nevertheless, listening behaviors remain underexplored (Bodie et al., 2013; Bodie et al., 2015; Jones, 2011), especially in couples talking about stress. The current article thus seeks to understand mechanisms of listening and its association with supportive behaviors during couple conversations, as well as with subjective evaluations of partner support and relationship satisfaction.

The Role of Listening for the Relationship

Weger et al. (2014) conceptualize active listening with three elements. First, the listener shows interest in the speaker's message by nonverbal behaviors such as back channeling. Back channeling behavior includes brief acknowledgements showing that the listener is following the conversation, such as "mmh" or "yeah". Second, active listening includes paraphrasing the partner's message without evaluations or judgement. The third element is comprised of open questions that would encourage the speaker further to elaborate on his/her personal thoughts and feelings. These elements reflect Rogers' basic variables of interpersonal empathic listening (Rogers, 1951) and have several functions in the context of emotional disclosures of stressful events.

First, listening is necessary and inevitable if one wants to *understand* a partner's stressful experience and its meaning for the disclosing partner. According to the Systemic Transactional Model (STM; Bodenmann, 1995b, 2005), the supporting partner must first perceive and decode the stressed partner's signs of stress in order to understand the significance of the stressful situation. As Garland (1981) states, "a spouse's perceptions of the partner's communicated attitudes, feelings, and behavior should be more accurate if he [or] she listens to the partner more effectively" (p. 298). This understanding, in turn, is needed to

adjust to the situation and provide adequate supportive coping that fits the needs of the stressed partner (Bodenmann, 2007; Cutrona et al., 2007; Garland, 1981; Jones, 2011).

Second, listening attentively and understanding the partner's stress also has an effect on the disclosing partner him- or herself. In fact, active listeners are also *perceived* as more understanding (Cahn & Frey, 1992), responsive (Reis et al., 2017), and supportive (Collins & Feeney, 2000). Consequently, when partners are perceived to be more understanding and responsive, research shows that partners feel more intimate (Prager & Buhrmester, 1998; Reis & Shaver, 1988) and satisfied (Cahn, 1990) after having disclosed about a personal stressor – an effect also found in diary studies (Laurenceau et al., 2005).

Third, listening encourages more self-disclosure of the other partner. When partners listen attentively, the speaker is more prone to talk without being afraid of receiving negative judgements (Burleson & Goldsmith, 1998). Moreover, people talking about their stress disclose more details when their partner is attentive and responsive (Miller, Berg, & Archer, 1983). Therefore, listening can be seen as „an essential component of interpersonal communication and of relationships more generally" (Bodie et al., 2013, p.114).

Listening in Couple Intervention Programs and Research

Therefore, in relationship education programs and couple therapy communication plays a crucial role and "speaker" and "listener" rules are key components of these interventions (e.g., Hahlweg, Revenstorf, & Schindler, 1984). In communication trainings, partners are prompted to provide active listening and to summarize important aspects of the stress expression in order to enhance the partner's deeper understanding and the process of jointly coping with the stressor (also called "dyadic coping"; Bodenmann, 2005). The Couples Coping Enhancement Training (CCET; Bodenmann & Shantinath, 2004), for example, strengthens feelings of intimacy and "we-ness" and allows the couple to build up the dyadic coping repertoire. The efficacy of this intervention program has been repeatedly documented (e.g., Bodenmann et al., 2002; Zemp et al., 2017), also in observed behavior (Widmer et al., 2005). Nevertheless, we do not know yet how and why listening, as a key element of communication trainings increases couple's functioning, since the effects of listening have not yet been investigated as such but only in combination with other and more general effects as positive communication (Hafen & Crane, 2003).

Despite the theoretical and clinical awareness of the pivotal role of listening as a prerequisite of responsiveness in effective communication, research on this variable is surprisingly rare (Bodie et al., 2015; Jones, 2011), especially for couples talking about stress. Although behavioral coding systems of interpersonal interactions (i.e., communication, dyadic

coping) mostly include listening as a category either directly or indirectly, this variable is mostly embedded in general positive communication behavior. Studies using observational data that coded listening specifically examined informal helping conversations between strangers (Bodie et al., 2015), conflict or problem-solving discussions (e.g., Gottman, 1994; Gottman et al., 1998; Pasupathi et al., 1999), or dyadic coping conversations (Bodenmann, 2000; Widmer et al., 2005). While Gottman et al. (1998) questioned the usefulness of active listening in conflict discussions and criticized relationship education programs that traditionally aim to promote this communication behavior, researchers (Hafen & Crane, 2003; Stanley, Bradbury, & Markman, 2000) pointed to several methodological weaknesses of Gottman's study, and warned about conclusions being drawn too fast. During conflict discussions, partners often show insufficient listening as they are primarily motivated to advance their own views or to solve the problem at stake rather than to understand or validate the partner's perspective or personal concern. In the context of emotional disclosure related to stressful experiences, however, listening might play a different role.

Given the fact that the importance of listening is generally acknowledged, one might wonder how listening can be the most effective. In what particular moments might listening enable understanding and adequate dyadic coping? As Schumm (1983) noted, listening is relevant in moments of self-disclosure. Although more recent studies are starting to identify crucial moments of stress disclosure (e.g., on days where the workload was particularly high; Laurenceau et al., 2005), researchers often used aggregated data such as average scores of partner support. Micro-processes of dyadic coping processes distinguishing between listening and other categories of support could yield valuable insights into underlying mechanisms (Johnson & Bradbury, 1999). Hence, research should focus more on moment-to-moment dynamics and crucial moments during a conversation in order to identify the behaviors (e.g., listening) that are relevant for the couple's functioning. Jones (2011) also underlines the importance of examining the interdependent processes of partner's behaviors unfolding over time "in order to capture the complex nature of both listening and providing emotional support" (p. 92).

Current Study

In the present study, we thus seek to understand mechanisms related to listening by studying dyadic interactions in which partners talk about a stressful experience that they have undergone, using observational data. First, we graphically display and examine the temporal course of the observed stress-related self-disclosure ("stress expression"), listening and dyadic coping behavior during couples' conversations. Furthermore, based on the assumptions of the

STM, we investigate whether the listening of one partner occurring simultaneously with the stress expression of the other partner is functional for subsequent dyadic coping and subjective measures such as relationship satisfaction. Specifically, we predict that listening will co-vary with more functional dyadic coping (e.g., emotion-oriented dyadic coping) and less negative dyadic coping displayed in the conversation due to an enhanced understanding of the partner's experience. Because listening and dyadic coping behaviors cannot be provided at the same time though, we expect that partners who listen intensively would not be able to verbalize much affective understanding or support during the conversation. Additionally, we expect that those who do not listen at all either provide no or inadequate emotional dyadic coping since they might not be very motivated to truly understand their partner via listening. This phenomenon would be displayed in a quadratic effect[8] of listening on emotion-oriented dyadic coping. In addition, we hypothesize that adequate listening also affects the general subjective perception of the partner's dyadic coping and relationship satisfaction, as assessed with questionnaires.

Method

Participants

The current study used data from a larger research project investigating the impact of stress on the development of couple relationships. Couples were recruited in 2011 via newspaper advertisements and on the radio. To be eligible, couples had to be in their current relationship for at least one year. In total, 368 heterosexual couples filled out questionnaires and took part in videotaped couple conversations. Three couples did not have observational data (one couple refused to participate in the interaction task, one couple wanted to delete their video after the task, and one video is missing due to technical problems), resulting in a final sample size of 365 couples with observational data.

Couple's age ranged from 20 and 80 years old with a mean age of M = 47.2 years for women (SD = 18.3) and M = 49.3 years for men (SD = 18.3). On average, partners were in their current relationship for M = 21.2 years (SD = 18.1, range: 1-60). Sixty-six percent of the couples were married, 85% lived together, and 65% had children. The sample is a middle-class sample as indicated by the participant's level of education and income (for detailed sample description see Kuster et al., 2015). The current dataset has already been used in other publications (e.g., Kuster et al., 2015).

[8] Similar to Olson (2011), we expect a curvilinear, i.e. quadratic model for emotion-oriented coping. In the model, he hypothesizes that too much or too little cohesion or flexibility would be unhealthy for marital and family functioning.

Procedure

Interested couples were informed about the procedure of the study and, after having agreed to participate, received a first set of questionnaires. They were instructed to independently fill out the questionnaires and bring them to the laboratory session. At the beginning of the session, couples signed the informed consent and filled in further questionnaires in separate rooms. For the observational data, couples indicated personal problems concerning topics inside and outside of the relationship on a list. Three different videos of 8 minutes were recorded: one standard conflict interaction task where couples discussed a common conflict and two mutual support tasks where each of the partners talked once about a recent stressor that was not related to the relationship. For the current analyses, data from the mutual support tasks were used. Couples were told to behave as in their daily life. In the end, couples were debriefed and received approximately 100 $. The procedure was evaluated and approved by the local ethics committee.

Measures

Observational measures. Stress expression, listening, and dyadic coping behaviors were coded on the basis of the videos from the two dyadic coping conversations (once man and once woman as speaker per couple). The coding of these behaviors was based on the Coding System for Dyadic Coping (SEDC; System for assessing observed DC; Bodenmann, 2000). This coding system was specifically developed to code support interactions in intimate relationships. Coders underwent a training period (at least 60h practice). At the end of the training period, coders had reached an acceptable interrater agreement of .90 (Cohen's kappa). Each video was coded by two coders of whom one focused on the man and the other on the woman. The videos were split into 48 sequences with 10 seconds each. Every sequence was coded for the stress communication behavior of the one partner and listening/dyadic coping behavior of the other.

***Stress expression*.** Stress expression was coded (1) during 10s-sequences when the disclosing partner was talking about a relevant stressful situation. Stress expression consists of four categories: *verbal problem-oriented stress expression* (e.g., asking the partner for advice or specific assistance), *neutral stress expression* (neutral or factual descriptions), and verbal emotional self-disclosures including *implicit stress expression* (e.g., superficial feelings such as "stressed" or "frustrated") and *explicit stress expression* ("I have never been that embarrassed" or "I was really hurt by that person's behavior"). We created a general stress expression score that indicated when one of the four stress expressions was coded during one

sequence of the conversation. Stress expression was not coded (0) when the disclosing partner talked about something that was not related to a stressor.

***Listening*.** As for stress expression, listening was coded using the SEDC (Bodenmann, 2000). Listening was coded during 10s-sequences (1) when the non-disclosing partner showed active, interested listening. The partner has to be oriented towards the speaker while seating and showing eye-contact. Listening was defined as nodding and back-channeling behaviors ("mmh", "yeah", etc.). In addition, asking open questions ("What happened exactly?", "How did you experience the situation?)", as well as more specific questions exploring the speaker's experience ("Was that aggravating?") were coded as listening.

***Dyadic Coping*.** Besides listening, the SEDC (Bodenmann, 2000) measures 1) problem-focused dyadic coping (e.g., giving advice), 2) emotion-focused dyadic coping (all emotion-focused positive verbal support; e.g., empathic understanding, showing solidarity with the partner, encouraging the partner), and 3) negative dyadic coping (e.g., hostile, insensitive, superficial support behavior). In one sequence, the listener receives only one possible score, thus, the behaviors are mutually exclusive in the coding system. If a listener showed 3 seconds of listening behavior but 4 seconds of emotion-focused dyadic coping, only the latter was coded.

Relationship satisfaction. Relationship satisfaction was measured by the German version of the Relationship Assessment Scale (RAS; Hendrick, 1988; Sander & Boecker, 1993). Both partners rated seven items on a 5-point scale with various verbal anchors depending on the content of the items (e.g., "How often do you wish you had not gotten into this relationship?" (reverse coded)). The psychometric properties of the RAS are good. Internal consistencies for men ($\alpha = .84$) and women ($\alpha = .84$) were acceptable.

Evaluation of dyadic coping. To assess a subjective evaluation of the dyadic coping quality in the relationship, we used the Dyadic Coping Inventory (DCI; Bodenmann, 2008b). Within this 37-item questionnaire, several forms of dyadic coping such as supportive, delegated, common, or negative dyadic coping can be differentiated. In addition, the evaluation of the dyadic coping in the relationship is measured with two items on a 5-point Likert scale ("I am satisfied with the support I receive from my partner and the way we deal with stress together"; "I am satisfied with the support I receive from my partner and I find as a couple, the way we deal with stress together is effective"). Cronbach's alpha was high with $\alpha = .87$ for men and $\alpha = .88$ for women.

Statistical Analyses

For the analyses, we used the intensive longitudinal data from the couples' videotaped conversations. The dataset of the observational data consisted of 365 (couples) × 2 (partners) × 48 (sequences) = 35,040 data points. To take the nested and dyadic structure of the data into account, we used a multilevel model for dyadic data that treats the three levels of our data (sequences nested within partners nested within couples) as two levels (for more details see Bolger & Laurenceau, 2013; Raudenbush & Bryk, 2002). As listening behavior was coded as a binary variable (0 = no listening, 1 = listening), we used a generalized mixed linear model with a logit link function, calculating average effects over all couples (fixed effects) and couple-specific residuals (random effects). We tested the optimal random structure with a stepwise procedure of model comparisons (comparing log likelihoods with a $\chi 2$-test; Zuur, Ieno, Walker, Saveliev, & Smith, 2009). This resulted in the specification of random slopes for all Level-1 within-person variables (sequence coded in minutes with, e.g., 1/6 representing the first sequence and 6/6 one minute, stress expression coded as 0 = absent and 1 = present). We used the lme4 package (Bates, Mächler, Bolker, & Walker, 2015) for multilevel modeling in R.

We extracted the individual random slopes of stress expression from the multilevel models. The slopes represent the strength of the association between stress expression of the one partner and listening behavior of the other one. Because we had one conversation for the men's stress expression and one for the women's, each couple had two slopes. These slopes of listening during stress expression were normally distributed and had a mean of $M = 0.00$[9] ($SD = 1.68$, range: -3.65 – 3.62) for men and a mean of $M = 0.00$ ($SD = 1.40$, range: -4.19 – 3.05) for women, showing that there is a lot of variability in how close people listen to their partner's stress expression.

We then estimated several multiple regression models (see Table 6) with the random slope as independent variable, the intercept of the listening behavior as control variable and relationship satisfaction of men and women, the evaluation of the coping and the specific coping behaviors during the conversation as dependent variables. We did not estimate Actor-Partner Interdependence models due to the high shared variance ($r = .83$) of men's and women's listening slopes.

[9] The mean is close to zero because listening occurs approx. 50% of the cases.

Results

Preliminary Analysis

Table 5 presents the means, standard deviations, t-tests and intercorrelations of the mean amount of listening, stress expression and coping behaviors that were observed during the 48 sequences of the conversations for the two conversations as well as the evaluation of dyadic coping and relationship satisfaction. On average, listening and stress expression were displayed about half of the time of the conversation. Men's and women's listening behavior did not differ, but women expressed significantly more stress ($t(364) = 3.77$, $p < .001$). Men were showing significantly higher problem-oriented coping than women ($t(364) = 4.15$, $p < .001$). As generally expected, listening to the partner expressing stress was highly correlated across partners within the conversation ($r = .80$ for men listening and $r = .84$ for women listening). Men reported slightly higher relationship satisfaction than women ($t(364) = -2.24$, $p = .025$).

Table 5. *Intercorrelations, Means, and t-Tests of All Study Variables*

		1	2	3	4	5	6	7	Women's Stress Conversation		Men's Stress Conversation		*t*
									M (*SD*)	Range	*M* (*SD*)	Range	(*df* = 364)
1	Stress Expression	**.22****	.80***	.11*	.08	.13*	-.02	-.08	0.50 (0.20)	.00 - 1.00	0.45 (0.22)	.00 - .98	3.77***
2	Listening	.84**	**.29****	-.04	.07	-.23**	.07	.07	0.42 (0.22)	.00 - .94	0.42 (0.22)	.00 - 1.00	.33
3	Problem-Oriented DC	.10	-.02	**.28****	-.14**	-.08	.03	.01	0.13 (0.15)	.00 - .73	0.09 (0.12)	.00 - .65	4.15***
4	Emotion-Oriented DC	.13*	.13*	-.06	**.17****	-.06	.07	.08	0.03 (0.05)	.00 - .38	0.03 (0.05)	.00 - .31	1.33
5	Negative DC	.06	-.17**	.05	-.12*	**.10**	-.12*	-.15**	0.02 (0.07)	.00 - .69	0.01 (0.04)	.00 - .40	1.84
6	Evaluation DCI	.03	.10	-.02	.13*	-.21**	**.43****	.64**	3.96 (0.86)	1.00 - 5.00	4.02 (0.76)	1.00 - 5.00	1.23
7	Relationship satisfaction	.00	.07	.01	.14**	-.18**	.64**	**.60****	4.33 (0.50)	2.29 - 5.00	4.38 (0.47)	2.43 - 5.00	2.24*

Note. DC = dyadic coping; DCI = Dyadic Coping Inventory. Variables 1-5 represent the average score throughout the conversation. Correlations for women's conversation (with women expressing their stress and men coping) as well as women's evaluation and relationship satisfaction are presented above the diagonal, correlations for men's conversation (with men expressing their stress and women coping) as well as men's evaluation and relationship satisfaction are presented below the diagonal, and correlations between men and women are displayed in the diagonal (marked in bold).

* $p < .05$. ** $p < .01$. *** $p < .001$ (two-tailed).

The Temporal Course of Listening, Stress Expression, and Coping Behaviors

Figure 8 and 9 show the general course of listening, stress expression and coping for the two conversations where either the man or the woman talked about a stressful experience. For a simplified illustration, we display the total amount of coping instead of the different forms. For each 10s-time point (sequence), the amount of couples in percent displaying the respective behavior is indicated on the y-axis. In general, the beginning of the conversation documents the highest amount of couples showing stress expression for both conversations. In fact, out of 365 couples, 76% of men and 79% of women show stress expression in the third sequence 20 seconds after the beginning of the conversation, which marks the highest point of stress expression. We can also observe a decrease in stress expression over the course of the conversation. In the last sequence, for example, only 23% of men and 28% of women still express stress. Similar results can be denoted for the listening behavior. The listening behavior is observed parallel to the stress expression and decreases over time. The amount of couples showing coping behaviors increases during the course of the conversation.

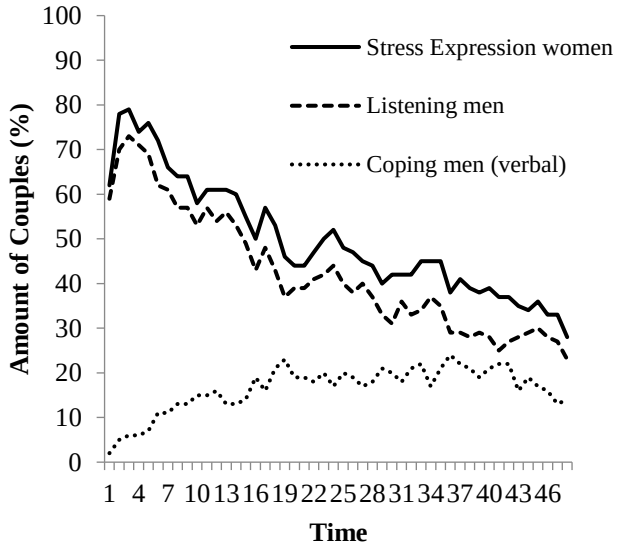

Figure 8. Temporal course of women's stress expression, and men's listening and coping behaviors as observed in the dyadic coping conversation.

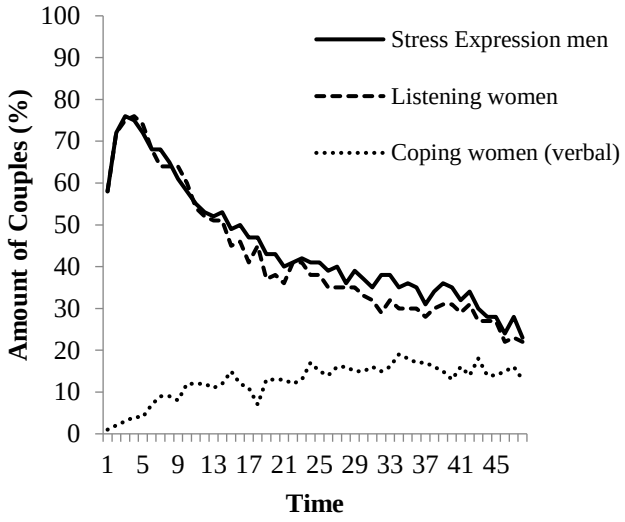

Figure 9. Temporal course of men's stress expression, and women's listening and coping behaviors as observed in the dyadic coping conversation.

For illustrative reasons, we also display the two extreme groups with respect to the interplay of stress communication and listening behavior (Figures 10 & 11). The graphs on the left hand show the couples with the weakest association of listening and stress expression (15% of the couples with the lowest slopes), the "bad" listeners. These couples have a negative individual slope, which was extracted from the multilevel model (M = -2.53, SD = 0.44, range: -3.65 – -1.92 for men's conversations and M = -2.12, SD = 0.54, range: -4.19 – -1.58 for women's conversations). On the right side, the "good" listener couples with the strongest association of listening and stress expression are displayed (15% with the largest slopes), as indicated by the multilevel random slopes (M = 2.46, SD = 0.54, range: 1.99 – 3.62 for men's conversations and M = 2.06, SD = 0.37, range: 1.55 – 3.05 for women's conversations). These graphs are intended to visualize the difference of the temporal course for the extreme "good" and "bad" listeners and their difference in coping behavior. Per definition, the group of "bad" listeners shows an asynchrony for listening and stress expression, whereas the "good" listeners have very similar amounts of stress expression and listening per time sequence. However, the coping behavior also differs between the two groups. Whereas the "good" listeners show only very little coping, the "bad" listeners cope much more during the conversation. It thus seems important to investigate what type of coping the couples are using and what this might imply for the relationship.

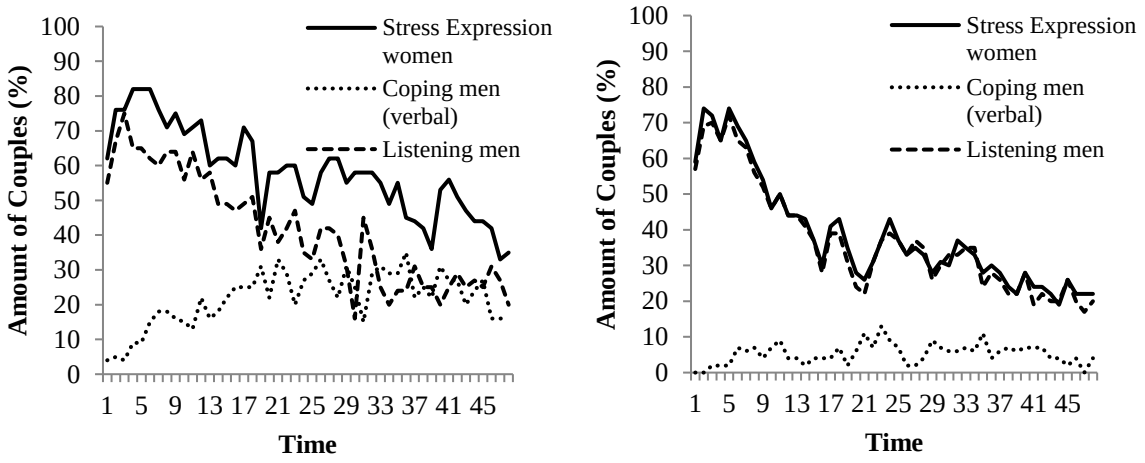

Figure 10. Temporal course of women's stress expression, men's listening and coping behaviors as observed in the dyadic coping conversation split for "bad" (left) and "good" (right) listeners.

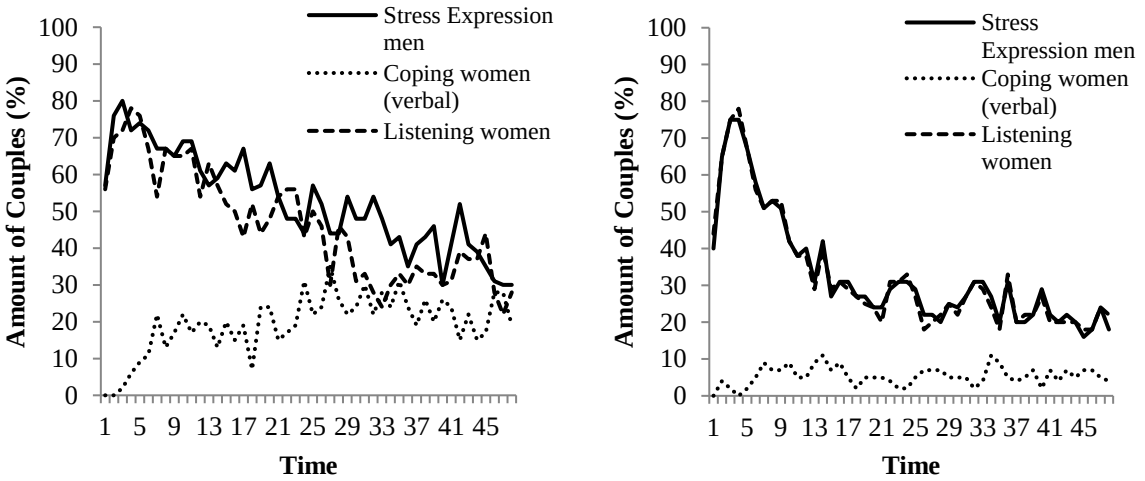

Figure 11. Temporal course of women's stress expression, men's listening and coping behaviors as observed in the dyadic coping conversation split for "bad" (left) and "good" (right) listeners.

Regression Analyses between Listening and Different Outcomes

Table 6 displays the results of the multiple regression using the random slopes as predictor for coping behavior during the conversation as well as relationship outcomes as measured with questionnaires (evaluation of the dyadic coping, relationship satisfaction). The random slopes (as measures of association) indicate the strength of the association between stress expression and listening, thus how likely partners listen when the other one is disclosing. We also used the random intercept as predictor in order to control for the principle level of listening, that is listening behavior that is not triggered by a stress communication (the intercept reflects the ratio of listening behavior if there is no stress communication) Because of the sparse research in this field, our analyses are exploratory to some extent and should be used as a basis for further investigations. To correct for multiple testing, we lowered the Type-I error rate to $\alpha = .005$.

Table 6. *Results from the Multiple Regression Analyses of the Multilevel Intercept and Slopes on Video Data and Questionnaire Outcomes*

	Men's Stress Conversations								Women's Stress Conversations							
Observational	B	*t*	*p*	*F*	R^2_{total}	R^2_{change}	f_{total}		B	*t*	*p*	*F*	R^2_{total}	R^2_{change}	f_{total}
Problem-Oriented	Constant	.099	18.011	.000	55.063*	.233	.191	.55	Constant	.135	19.152	.000	49.886*	.216	.172	.52
DC	Intercept	-.017	-3.300	.001					Intercept	-.013	-2.010	.045				
	Slope	-.043	-9.505	.000					Slope	-.058	-8.902	.000				
Emotion-Oriented	Constant	.026	10.929	.000	1.449	.008	.008	.09	Constant	.030	11.141	.000	1.811	.010	.010	.10
DC	Intercept	.002	.901	.368					Intercept	.002	.857	.392				
	Slope	.003	1.669	.096					Slope	.005	1.863	.063				
Emotion-Oriented	Constant	.031	9.256	.000	2.595	.021	.021	.15	Constant	.037	10.410	.000	4.151*	.033	.033	.18
DC^2	Intercept	.002	.773	.440					Intercept	.002	.923	.356				
	Slope	.003	1.514	.131					Slope	.004	1.755	.080				
	$Slope^2$	-.002	-2.203	.028					$Slope^2$	-.004	-2.959	.003				
Negative DC	Constant	.014	6.455	.000	27.214*	.131	.126	.39	Constant	.021	6.413	.000	38.754*	.060	.043	.46
	Intercept	-.012	-6.001	.000					Intercept	-.021	-7.079	.000				
	Slope	-.013	-7.241	.000					Slope	-.026	-8.507	.000				
Questionnaire																
Evaluation DCI	Constant	4.015	100.791	.000	1.722	.009	.003	.10	Constant	4.015	101.161	.000	3.064†	.017	.017	.13
Men	Intercept	.067	1.850	.065					Intercept	.061	1.700	.090				
	Slope	.038	1.162	.246					Slope	.090	2.467	.014				
Evaluation DCI	Constant	3.962	88.851	.000	3.59†	.020	.018	.14	Constant	3.962	89.792	.000	6.856*	.036	.036	.19
Women	Intercept	.096	2.378	.018					Intercept	.107	2.704	.007				
	Slope	.093	2.531	.012					Slope	.156	3.850	.000				
Relationship	Constant	4.385	180.878	.000	4.38†	.024	.024	.16	Constant	4.385	182.082	.000	6.856*	.036	.032	.19
Satisfaction Men	Intercept	.044	2.008	.045					Intercept	.026	1.195	.233				
	Slope	.059	2.959	.003					Slope	.077	3.485	.001				
Relationship	Constant	4.334	171.548	.000	10.829*	.056	.036	.24	Constant	4.334	168.448	.000	3.958†	.021	.020	.15
Satisfaction Women	Intercept	.105	4.585	.000					Intercept	.029	1.255	.210				
	Slope	.078	3.731	.000					Slope	.065	2.751	.006				

Note. $N = 365$. DC = dyadic coping; DCI = Dyadic Coping Inventory. Intercept (random intercept) and slope (random slopes) were derived from the multilevel models and represent the within-couple association between stress expression and listening. To test for quadratic effects, we added the squared slope as a predictor for emotion-oriented DC.

Effect sizes were calculated based on Cohen (1992): $f = \sqrt{\frac{R^2}{1-R^2}}$. R^2_{total} refers to the model including intercept and slope, R^2_{change} refers to the change when the slope is added as a predictor.

† $p < .05$, * $p < .01$ (two-tailed).

Predicting the observed coping behaviors with the random slopes showed that the stronger listening was associated with stress expression (positive random slope), the less problem-oriented coping was displayed throughout the conversation. Effect sizes (J. Cohen, 1992) indicated strong effects ($f = .55$ for men's conversations and $f = .52$ for women's conversations). The same effect was found for negative coping with effect sizes ranging from $f = .39$ for men's conversations and $f = .46$ for women's conversations.

Emotion-oriented coping was not associated with the random slopes for both conversations when we tested for linear effects only. However, as expected, the conversations for the couples with the highest slopes of listening (highest 15%; see Figures 10 & 11) have a listening behavior that is overlapping with the stress expression during which almost no coping behavior is observed. We thus additionally tested for a quadratic association since partners who always listen to the disclosing partner may prevent themselves from providing emotional support. We thus ran additional regression analyses with the quadratic term of the slope. The results confirm our expectation that a moderate amount of listening might be the most suitable in order to provide more emotion-oriented coping for women's stress conversations, however, the effect is only moderate ($f = .18$). For men's conversations, the regression model was not significant.

Regression models to predict the evaluation of dyadic coping (as measured with the questionnaire) reveal that only women's evaluation of dyadic coping is associated with the random slope parameter. That is, the closer the relation between stress expression and active listening in cases where women are disclosing, the better they evaluate their partner's dyadic coping efforts. With respect to relationship satisfaction, we found that both partners' relationship satisfaction can be predicted by the association of self-disclosure and active listening: the closer the association the higher the relationship satisfaction irrespective of who is expressing the stress. Yet, the regression parameter linking the random slope of women's stress conversations to their own relationship satisfaction just fails to reach significance ($p = .006$). The strongest effect size is found for women's relationship satisfaction in men's conversations ($R^2 = .056$), indicating a moderate effect ($f = .24$). The more listening women thus display during their partners' stress expression, the more satisfied they are. A similar finding is evidenced for men. In addition, men are also more satisfied when their partners listen more closely. The intercept of listening shows significant associations with women's relationship satisfaction only for the men's conversations that might indicate that men's listening score without female stress expression is not as relevant as women's listening intercept.

Discussion

The aim of this article was to investigate listening behavior during a support conversation and its association with different dyadic coping behaviors, the evaluation of the dyadic coping, and relationship satisfaction. The study provides evidence for two aspects: 1) although there are inter-individual differences in the associations of stress expression and active listening, overall, partners listen quite closely to the other partner's stress expression, and 2) active listening is strongly related to dyadic coping behaviors that occur in the same conversation, as well as to women's evaluation of dyadic coping and relationship satisfaction.

The graphs of the temporal course illustrate how listening and stress expression represent parallel processes. When listening and stress expression decrease, coping behaviors increase. These observations are in line with the assumptions of the Systemic Transactional Model (STM; Bodenmann, 2005). Thus, we can assume that the partners generally first try to understand by listening before they provide dyadic coping, which is what the Couple Coping Enhancement Training (CCET; Bodenmann & Shantinath, 2004) or Coping-oriented Couple Therapy (COCT; Bodenmann, 2010) recommend. In a way, listening might already be seen as a support strategy (Weger et al., 2014). Jones (2011) followed this conceptual debate whether listening counts as a form of support, and concluded that listening is a key mechanism of emotional support. As evident from Figures 8 to 11 and the regression analyses, listening and dyadic coping are strongly interrelated. While the "good" listeners, thus the partners listening closely to the other one expressing stress, provide less problem-oriented and negative coping, the "bad" listeners are asynchronous to their partner and engage much more in giving advice or dysfunctional negative support. The listener might be overwhelmed or flooded with the partner's stress, and might be thus more occupied with one's own stress regulation with less resources left to pay attention to the other partner (Jones, 2011; Muraven & Baumeister, 2000). The problem-oriented and negative coping might thus be verbalizations that cover up the fact that they were not able to pay attention or they were overwhelmed by the situation. Alternatively, partners might lack the competence of active listening because they had never learned it in the first place. Another explanation might be that these partners are less committed to the partner, show decreased motivation in dyadic coping efforts and less satisfied with the relationship. Bodie et al. (2015) observed that conversations characterized by less listening "do not flow as smoothly" (p. 166) and that, in consequence, disclosing partners have difficulties expressing themselves. In a similar vein, Notarius and Herrick (1988) reported that listeners who primarily gave advice instead of engaging in supportive listening techniques were significantly more depressed and more rejecting of their distressed

confederates than were listeners who acknowledged the distressed person's mood, which might be shown via more emotion-oriented support. Jones (2011) also states that advice is often neither well received nor wanted in the first place, which might explain the fact that listening less closely to the partner is associated with lower relationship satisfaction. Further research could test for potential mediating effects for listening and relationship satisfaction. Additional studies on physiological arousal and listening should be conducted to affirm our assumptions about partners being too overwhelmed to listen closely.

Our results show some differences in men and women in stress expression and dyadic coping competences, as has been reported in previous studies (Barbee et al., 1993; Bodenmann et al., 2015; Dindia & Allen, 1992; Noller, 1980). The fact that women are talking significantly more about their stress also matches with previous findings that women also report having more stress (Matud, 2004). In addition, Figure 1 suggests that women, on average, listen more closely than men. Future studies should investigate gender differences in more detail during the temporal course of the conversation.

At present, it is not clear, how different types of stress expression shape listening behaviors. Whereas research reported gender differences for types of stress expression (e.g., factual vs. emotional), and investigated how forms of stress expression are linked with different dyadic coping efforts (see Study I; Kuhn, Milek, Meuwly, Bradbury, & Bodenmann, in press), it remains unclear whether listening is also dependent on different types of disclosure and differs for men and women.

When looking at time processes, one might wonder whether there is a "good" time point when dyadic coping should set in during the conversation. Obviously, it depends on the intensity and complexity of the stress experience being disclosed at what time point exactly the dyadic coping is perceived as helpful and not incomprehensive and overwhelming. Our analyses have advanced on this question by showing that good listening coincides with better dyadic coping efforts and a better evaluation of the dyadic coping in women, and thus seems to be crucial for relationship functioning.

Strengths and Limitations

Major strengths of the current study are the inclusion of intensive longitudinal observational data, the focus on listening behavior, and the investigation of the temporal course of the observed behaviors. Including observational data limits the risk of having inflated results due to shared method variance, and the additional inclusion of questionnaire data enables us to test our hypotheses using different methodological approaches.

Furthermore, this study investigates the temporal dynamics of supportive discussions, which has rarely been done before.

Our results are limited, however, to fairly satisfied, heterosexual couples that made up the majority of our sample. Nevertheless, this might imply that our analyses concerning the association between relationship satisfaction and listening might be even more conservative. Severely unsatisfied couples might display much less listening behavior. Second, since the couple conversations took place in a laboratory, we do not have naturalistic observations of the couples speaking with each other. Listening partners might have feel pressured to show favorable behavior and thus showed more attentive behavior towards their disclosing partners (Jones, 2011). In fact, conversations as in our analyses occur rarely in daily life with back-channel communication only compromising about 8% of the respondent's behavior (Alberts, Yoshimura, Rabby, & Loschiavo, 2005). Third, in our coding system, we do not make a clear difference between verbal listening and nonverbal signals of the partner listening to the other. Having information about verbal listening such as asking questions would provide further insight into the listener's role and the effect of listening on the speaker. In the literature, listening is often a combination of nonverbal and verbal behaviors. Some definitions distinguish between different forms of listening and analyze differential effects of nonverbal and verbal behaviors. Gottman, Markman, and Notarius (1977) and Gottman (1979), for example, found that nonverbal behaviors provided more information in order to discriminate between distressed and nondistressed couples. Jones (2011) defines active listening as verbal strategies (e.g., asking clarifying questions), and passive listening as nonverbal such as giving back-channeling cues. As Weger et al. (2014) could show with participants and trained confederates, active listening evoked the most favorable responses concerning feeling understood and the satisfaction with the conversation. Similar findings might be expected for intimate relationships. In addition, Bodie et al. (2015) observed that active verbal listening was more important than nonverbal listening for improvement of affect after the conversation. Future research could thus investigate the different types of listening behaviors.

A statistical limitation of this study includes the two-step approach. The slopes used as predictors for the multiple regression models might not be error free. One possible alternative might be to include, for example, relationship satisfaction as a moderator in the multilevel model. Lastly, we cannot draw conclusions on causality. Although the relationship between listening and relationship outcomes is most probably bi-directional, it is not possible to ascertain that the listening behavior has a causal effect on relationship satisfaction. As an alternative explanation, less satisfied couples might make fewer efforts to connect to their

partner during the conversation. However, women indicate being more satisfied with the dyadic coping they receive from their partner the closer their male partners listen during the conversation. This finding leads to the assumption that the partner's listening behavior has the potential to increase the satisfaction with the coping.

Clinical Implications

As our study could show, listening attentively to the partner's stress expression has beneficial effects for the relationship. Clinicians might be able to improve couple's competences and functioning by focusing even more on effective listening. Effectiveness studies on the 3-phase method (Bodenmann, 2007), where the first phase is devoted to stress expression of the one and listening of the other partner, confirm that relationship education programs and couple therapy should continue to strengthen listening competences in the relationship. Listening seems to be a key component for dyadic coping and communication in general. Enhancing the partners listening might thus be a promising way to enhance relationship satisfaction and mutual intimacy. Evaluations of the 3-phase method revealed that partners experience empathic listening as one of the most beneficial forms of support (Bodenmann, 2000, 2007). This study highlighted why this is the case and how the fine tuning between self-disclosure and listening should be a focus of the therapists. Encouraging couples to listen more attentively in daily life might create positive changes in the experience of support with long-lasting effects on the relationship satisfaction.

Conclusion

The current study takes existing literature on listening a step further by investigating the temporal course of couple conversations discussing a personal stress experience with observational data. The associations of listening with coping behaviors and couple's relationship satisfaction portray the importance of listening behaviors when communicating with the partner. Future research should now address questions regarding the quality of listening, different forms of listening as well as the important time points when listening plays a particular role. Furthermore, gender differences regarding these aspects should be addressed further in future studies.

11.

STUDY III

When Your Partner Really Listens: Stress Communication in Couple Conversations

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12. General Discussion

The aim of this thesis was to understand how mutual, dynamic coping processes unfold within real-time interactions of partners engaging in a dyadic coping conversation. In detail, this thesis examined how actual behaviors of stress communication, listening, and dyadic coping are linked throughout the course of a conversation. With a focus on the *process* of the coping, this thesis investigates the way how partners adapt their behavior towards one another during the conversation. Due to the emphasis on within-person processes, this thesis sheds new light on micro-processes that take place within a matter of seconds. This novel perspective allows a better understanding of the mechanisms of couple interactions that have not been investigated before. The methodological micro-analysis approach of the current thesis might be applied to other couple interaction contexts as well as, more broadly, in research in general. In addition, concrete behaviors during the dyadic coping conversation are put into the context of relationship satisfaction in order to understand mechanisms of well-functioning or maladaptive relationships. Implications for future research, couples, and therapists are discussed.

12.1. Summary of Findings

Study I

Study I examined within-couple processes between different types of stress expression and coping in experimentally stressed couples. The study was based on the assumption that support (i.e., dyadic coping) should match the stressed partner's needs. The different forms of stress expression and coping were based on the categorization of the STM (Bodenmann, 2005). On the descriptive level, stress was mostly expressed in a neutral fashion. Similarly, Bodenmann (1995b) states that verbal explicit stress expressions seldom occur, even though they might be the most essential to foster partner's understanding (Bodenmann, 2007). Most of the variance was within rather than between individuals which justifies our focus on the within-couple level. In line with research on gender differences (e.g., Dindia & Allen, 1992), stressed women showed significantly more problem-oriented, neutral and emotion-oriented stress expressions than stressed men.

Main results showed that partners were able to continually adjust their coping behavior throughout the conversation. Especially problem-oriented stress expressions seemed to enable supporting partners to provide congruent dyadic coping. Other studies (Bodenmann, 2000; Cutrona et al., 2007) have reported comparable results. Cutrona and colleagues (2007), for example, observed that couples provided more informational support after requests for

information (53% of the time), but only provided emotional support 25% of the time following the description of emotions. Problem-oriented stress expressions seem thus easier to be perceived and decoded, whereas emotion-oriented stress expressions are often more ambiguous and harder to interpret correctly (Bodenmann, 2005). Emotion-oriented stress expressions were similarly linked with emotion-oriented dyadic coping, although less clearly than problem-oriented stress expressions with problem-oriented dyadic coping.

The likelihood for negative dyadic coping increased during nonverbal, neutral and emotion-oriented but not problem-oriented stress expressions. Pursuant to other research on indirect support seeking, including nonverbal stress communication, these ambiguous messages can backfire and provoke negative responses (Barbee & Cunningham, 1995; Barbee, Rowatt, & Cunningham, 1998; Don et al., 2013). Interestingly, the statistical model for negative dyadic coping fits the data less well, which might indicate that negative dyadic coping could be influenced by several other factors (e.g., low relationship satisfaction, lack of motivation) than only the partner's stress expression during the conversation.

One important consideration in the context of stress expression might be the finding that people are actually not very good at seeking support. People often seem uncomfortable seeking help, for example, as this might make them feel incompetent, inferior, or unequal towards their partner (Barbee et al., 1998). As also observed in our study, communication often happens indirectly, such as hinting or complaining, rather than direct, explicit stress expressions (Verhofstadt et al., 2008). A reason for that might be that partners habitually assume that their spouse will be able to interpret subtle signals without being explicitly told (Cutrona, 1996). Indeed, spouses tend to overestimate the extent to which their partners are even aware of their stressors (Pickersgill & Beasley, 1990). Given the possibility for improvement in stress communication, and based on the findings of Study I, important clinical implications can be drawn that are discussed later on.

Study II

Study II focused on the partner reaction while stressed partners communicate their stress. Whereas studies usually investigate the supportive verbal behavior of the other partner, listening behavior is being mostly overlooked in relationship research. However, partners first need to *listen* to understand the stressed partner's situation. Study II therefore analyzed listening behavior occurring during stress expression. The more a partner listened while the other partner was talking about the stress, the less problem-oriented and negative coping were displayed by the listener during the same conversation. Additionally, listening during stress expression was significantly related to the satisfaction with dyadic coping and the

relationship. Figures 10 and 11 demonstrate how some couples seem very much "in sync" with their partners, while others are "out of sync" (Collins et al., 2010, p. 373), thus not listening in the same sequences as their partners are expressing stress. Moreover, the latter are giving much more problem-oriented dyadic coping such as advice or information. Having a partner that would show empathic understanding (e.g., in the form of emotion-oriented dyadic coping), however, might be more adequate when being stressed. In fact, Cutrona and colleagues (2007) reported that the partner is being perceived as more responsive when providing emotional rather than informational support. Another study showed that active listening conveyed more understanding and caring than advice (Weger et al., 2014). In our study, a moderate amount of listening seemed to be the best for the provision of emotion-oriented support (see quadratic effect in Table 6). At first, this might seem counterintuitive since one would expect that the "good listeners" would be the ones that offer the most understanding to the partner. However, they are listening so closely to the stressed partner that they do not engage in further verbal support (note that the coded behavior categories are mutually exclusive). They might either need more time than the fixed 8-minute conversation time frame of the study, or their listening might be one form of emotional support so that no further verbal coping efforts are needed.

Study III

Following Study II which had highlighted the importance of the timing of listening, further analyses were conducted in Study III to understand which forms of stress expression trigger partner's listening responses. Moreover, Study II's findings were mainly on the between-level (even if the listening index was calculated on a within-couple level in a multilevel model), so that Study III was intended to further understand what mechanisms take place when stress is communicated. Analyses revealed that listening was more likely during sequences of stress expression. When relationship satisfaction was introduced as a moderator, men were more likely to listen during women's neutral expressions in more satisfied couples compared to less satisfied couples (within-couple level). Similar effects were found on the between-person level for male emotion-oriented stress expression and female listening. Partners were thus found to adapt their reaction towards the partner expressing stress, as was found in Study I.

As a conclusion of the three study results described above, listening and dyadic coping as prompt reactions were specifically adapted to the situation which provides evidence for the basic theoretical assumptions of the STM (Bodenmann, 2005). The findings of this thesis therefore empirically support theory-based statements of actual, enacted behaviors, and

highlight that stress expression and dyadic coping reactions in fact do resemble a constantly changing, dynamic process.

12.2. Strengths and Limitations of the Current Thesis

12.2.1. Strengths

A clear strength of this thesis is the chosen methodological approach as it considers the dynamic fashion of a couple conversation and takes into account how the behavior of one partner is linked to the behavior of the other partner in the same moment. This interdependence of the two partners is also considered on the statistical level using Actor-Partner Interdependence multilevel models (Kenny et al., 2006). In addition, the multilevel approach takes into account the statistical dependence of the own behaviors during one conversation (48 time sequences are "nested" within one person) and enables to control for between-couple effects. For example, a partner might generally listen more, and has thus a higher chance to display listening behavior in one specific moment. The separation of within- and between-couple effects is therefore essential in understanding the couple's functioning. As a result, this thesis advances research on psychology on a methodological level in that the applied statistical analyses go beyond the traditional current perspective in the stress and coping literature and illustrate new methods for elaborated micro-analyses. In addition, the differentiation between the different forms of stress expression and DC behavior (including listening) provides a more detailed picture than more simplified distinctions such as between problem- and emotion-oriented behaviors and allows us to explicitly test the assumptions of the STM in more detail.

Another strength lies in the two samples that were used for the empirical studies. For Study I, the dataset is based on an experimental design with observational data using 127 couples (SNF 100014-115948, SNF 100014-129627). Experimentally inducing stress (with the TSST, Kirschbaum et al., 1993) allows for a standardized observation of the effects of stress on the couple interaction. Moreover, partners were not explicitly instructed to talk about the stress (but to wait for a moment) so that a rather natural conversation was recorded. This procedure minimizes possible biases such as social desirability because couples do not try to behave in a certain way.

Study II and Study III are based on the second research project that is operated in cooperation with multiple research labs of the University of Zurich and also financed by the Swiss National Science Foundation (SNSF: CRSI11_133004/1). This project is unique in its structure (e.g., various questionnaires and behavioral observations) among the German

speaking area since 368 couples from three age cohorts are being observed in the long-term. Given the large sample size, the study is highly powered to find reliable results. High powered studies revealed in more "true positives" than the approach of conducting many small studies (Spellman, Gilbert, & Corker, 2017). Nonetheless, it is important to re-examine our analyses with further high powered studies to increase the credibility of our results.

The extensive observational data were coded in a time- and labor-consuming process. Combining these objective observational data with subjective self-report data (relationship satisfaction, evaluation of the dyadic coping) uses the particular strengths of each method and thus helps to gain a holistic, clearer perspective on couple functioning.

12.2.2. Limitations

Besides several strengths of the current thesis, some caveats should be mentioned. In the following, the common restrictions of the three studies will be discussed. Chapters 9-11 provide a more detailed discussion of the specific limitations that are subject to each study.

First, the two datasets with their big samples include mostly satisfied, mixed-sex Caucasian couples. In fact, the average relationship satisfaction score of Study II and III (M = 4.36, range 1-5) is similar to the score of only the couples that stayed together in the validation study of the RAS (4.34; Hendrick, 1988). Generalizability to more distressed, ethnically diverse, or homosexual couples is thus limited. Also concerning the study design, results cannot be generalized to daily life conversations since they took place in the laboratory. Furthermore, couples did not fill out an evaluation of how they perceived their partner during the conversation, which would allow for a closer comparison of objective and subjective measures.

Second, the operationalization of listening is very broad and does not differentiate between active (e.g., asking questions) and passive (e.g., nodding) listening. It is important to disentangle different types of listening (Bodie et al., 2015; Jones, 2011) as this differentiation might provide a clearer picture of the different functions of listening (e.g., understanding vs. being responsive).

Third, the time-based coding also limits statistical analyses in the sense that we do not know when exactly a certain behavior sets in or ends. The analysis of speech turns, for example, might be easier with an event-based coding, however, both approaches have pros and cons. Future studies might look at these processes with event-based codings, which would also take into account longer stress expression phases.

Lastly, as the focus of the current dissertation was lying on within-couple rather than between-couple processes, the current thesis only examined the first wave of the PASEZ-

study. It would be interesting to see whether couples display similar behavior during further measurements.

12.3. Further Considerations

Coping efforts might be well-intended, but inappropriate, excessive, or untimely (Coyne, Wortman, & Lehman, 1988; Rini, Schetter, Hobel, Glynn, & Sandman, 2006). In the following, these three aspects are discussed in relation to the current findings.

12.3.1. Invisible Support

The stress and coping literature has paid a substantial amount of attention to how much support a stressed partner feels to have received. However, studies on actual support efforts have documented that support receipt is not necessarily beneficial (e.g., Bolger, Zuckerman, & Kessler, 2000). One explanation is that this visible support entails some emotional cost (Gleason, Iida, Bolger, & Shrout, 2003). Support that was "invisible" to recipients was actually more effective in reducing distress (Bolger et al., 2000). Invisible support is support that is provided but not perceived from the recipient. This form of support has been linked to further positive outcomes for recipients (Gleason & Iida, 2015). Observed overt behaviors, as in the current thesis, might or might not be perceived by the stressed partner. Future studies might micro-analytically assess whether partners felt supported in a given sequence, for example, with the use of a video recall procedure as described later on. However, it might be likely that partners – in comparison to verbal dyadic coping efforts - did not perceive listening as a direct form of support. As a consequence, listening and paying attention to the partner expressing stress might be an efficient way of providing invisible support maintaining self-worth yet providing relief and the feeling of not being alone. Further, emotional support might not always be suited. In fact, individuals high in avoidant attachment tend to be more stressed when their partners express care and emotional comfort (Simpson & Overall, 2014). Again, listening might be a first step for avoidant partners in order to build up trust in the relationship.

12.3.2. Overprovision

Ineffective support might also come in the form of excessive support (Collins et al., 2010). Excessive support such as being overprotective or overzealous might lead to a fear of disclosing about oneself on the side of the stressed partner. For example, an over-engaged partner who directly engages in problem-solving or encouragement when the stressed partner simply needs some time to relax does not help to cope with the situation (see N. A. Roberts &

Levenson, 2001). Rafaeli and Gleason (2009) describe this situation as a "cycle of well-meant, but misguided, support" even though it might match the stress expression (p. 24). Underprovision and overprovision of support are associated with declines in marital satisfaction over the first 5 years of marriage. However, overprovision of support was observed to have greater effects on marital decline than underprovision (Brock & Lawrence, 2009). As the results of Study I show, clearer stress expressions might enable the partner to decode which behavior would be the most helpful to counteract under- or overprovision of support (see Brock & Lawrence, 2009). One might wonder whether there can also be an overprovision of listening. Results of Study II seem to show that some partners indeed provide less emotional dyadic coping because they are mostly occupied with listening. However, we do not know enough yet about the impact on the relationship and further investigations should be made on under- or overprovision of listening.

12.3.3. Contingency

This thesis is based on the assumption that dyadic coping should constitute a contingent and immediate reaction following the partner's stress expression (Study I). Yet, there might be instances where support might be given too early. Stressed partners might feel interrupted or not having been able to fully disclose, or listening partners might be too overwhelmed in the particular moment to provide an elaborate response. Therefore, prompt dyadic coping might not necessarily be ideal in all cases. For example, expressing understanding for the partner's stressful job situation (that had been quickly described during the week) during the weekend might foster the impression that the situation has not been forgotten and that the partner still cares. In comparison to newborn babies that still need to learn how their needs are attended to promptly and sensitively (Ainsworth, 1969), it remains an open question in what particular moments a contingent coping reaction is the most helpful and how big the latency period can be for adults. There might be situational and individual differences that determine the length of the latency period. Listening, on the other hand, should occur contingently, because otherwise the information cannot be transferred from one to the other partner. Analyses of Study II revealed that it is not the amount but the moment of listening that matters.

The current thesis did not test the *functionality* of contingent, matching dyadic coping but only investigated changes in behavior in one partner being related to changes in behavior of the other partner (Study I). There is no statistically sound procedure (without restraints in power and multiple testing) to test whether matching reactions of dyadic coping following

stress communication are related to relationship outcomes. However, contingency might be positively associated with relationship satisfaction. For example, satisfied couples were faster in responding to emotional stress signals than unsatisfied ones (Bodenmann, 1995b).

12.4. Future Avenues

Many questions remain unanswered as to how a "perfect" dyadic coping process might look like in regard to visibility, amount and time contingency of dyadic coping. New methodologies as well as coping in different contexts might help understand what couples' dyadic coping should look like in order to be the most helpful – also in the long run.

12.4.1. New Methodologies

With the advent of new technologies, couple interaction processes can be studied based on completely new theoretical and empirical perspectives. For example, the coding of the couple behavior might become more automatized. New computer-based methods to measure and categorize behavior are being developed (Atkins & Baucom, 2016). For example, signal processing methods for extracting features of communication such as "voice stress" (Busso, Lee, & Narayanan, 2009; Weusthoff, Baucom, & Hahlweg, 2013b, 2013a), programs designed to assess specific words (Linguistic Inquiry and Word Count; Pennebaker, Francis, & Booth, 2007) or the application of machine learning procedures (see additional analyses) are promising avenues that enrich observational studies. Video-recall procedures, in which subjects re-watch their interaction and indicate, for example, how they felt or how much partner support they perceived (Collins & Feeney, 2000; Leuchtmann, Horn, Kuhn, & Bodenmann, in prep; Verhofstadt et al., 2016, 2008) permit to closely monitor objective and subjective components of the couple interaction. For example, actual versus perceived listening might be measured with a video paradigm.

Biological measures as described in Chapter 5 can broaden the understanding of processes that take place during the conversation. For example, physiological processes during moments of expressing stress or feeling understood might reveal which behaviors could ultimately influence physiological well-being. The covariation between people in their moment-to-moment physiological states, known as "physiological linkage", has received some attention in research already (Levenson & Gottman, 1983; for an overview see Timmons, Margolin, & Saxbe, 2015) but could be further investigated for supportive conversations. Heart rate or skin conductance during listening would show how much the listener is actively involved and follows the stressed partner's communication empathically.

Naturalistic observations, such as the "electronically activated recorder" (EAR; Mehl, Pennebaker, Crow, Dabbs, & Price, 2001) might also yield further insights into dyadic coping processes unfolding in daily life. As Kuppens and Verduyn (2015) point out, "stepping outside of the lab comes with the price of losing tight control on third factors, but it does give a rich insight into the diversity and complexity of real life" (p. 78). For example, Wang and Repetti (2014) observed 30 couples in their everyday lives, and found that support was only rarely observed (about 4% of the time that couples were captured together on-screen). Similarly, couples with one partner having cancer talked about cancer-related issues approximately 5% of the time of the conversations (Robbins, López, Weihs, & Mehl, 2014). These results highlight that couple conversations are very different in daily life to what we observe in the laboratory.

12.4.2. New Statistical Analyses

Along with the upcoming technological progress, researchers have to increasingly rely on sophisticated mathematical and statistical modeling to deal with the complexity of the obtained data. In the field of emotion research, these new modeling techniques are already applied. Empirical research on the temporal dynamics of emotions considers fluctuations over time rather than an average score to discover the patterns and regularities (Houben, Van Den Noortgate, & Kuppens, 2015; Kuppens, 2015). For example, the tendency for emotions to be predictable over time is emotional inertia, and counts as one "emotion dynamic feature" (Koval, Butler, Hollenstein, Lanteigne, & Kuppens, 2015; Kuppens & Verduyn, 2015). With statistical progress, new theoretical frameworks are arising (act theory of emotions; Barrett, 2014; sociodynamic models of emotion; Mesquita & Boiger, 2014; appraisal theories of emotions; Moors, 2014). Emotions are closely connected to intimate relationships (e.g., "emotional covariation"; Kuppens & Verduyn, 2015), and theoretical and analytical advancements from the field of emotion research are starting to be applied in relationship research (Butler & Randall, 2013; for an overview see Schoebi & Randall, 2015).

The datasets in the current thesis were only categorized binominal (0 and 1), and did not include a measure of intensity (e.g., for explicit stress expression). The aforementioned new analyses, however, need to have intensity included in order to calculate dynamical processes. Therefore, researchers should already consider during the study design what kind of analysis based on their hypotheses they are planning to do.

Other developments in research include approaches that help visualize and analyze multivariate dynamics, for example, network analyses (Borsboom & Cramer, 2013; Bringmann et al., 2016; Ruzzano, Borsboom, & Geurts, 2015; Wichers, Wigman, Bringmann,

& Jonge, 2017), or cluster analyses with sequence data as described in the chapter of additional analyses (Studer & Ritschard, 2016; Studer, Ritschard, Gabadinho, & Müller, 2011). These novel tools open up a broad array of possibilities to further investigate interpersonal processes.

12.4.3. From Micro to Macro: Coping in Context

Besides new advances on the micro-level, relationships are still embedded in a broader context. When dyadic coping conversations are studied apart from the ongoing contexts, researchers may mistakenly attribute the couple's behavior to the interaction only than to broader contexts in which they would naturally occur. Contextual factors such as type and intensity of stress, as well as the stress level of both partners, relationship conflicts, or culture might play a role.

In the empirical articles of this thesis, couples were either faced with a laboratory-induced stressor or discussed everyday stress. Therefore, usually no major stressors such as an illness or job loss of one of the partners were discussed. Especially in the context of illness – as much of the research on couples coping with cancer indicates – partner support is crucial. However, given the higher intensity of stress, a micro-analysis of the dyadic coping conversation might look quite different. For example, listening partners might be more involved and thus stressed themselves limiting their capacity to provide adequate support. When the listener's resources are limited, the stressed partner's needs are less often recognized (Gleason & Iida, 2015) and coping might be impaired. For example, men's support quality decreased when they were stressed at the same time (Bodenmann et al., 2015). Men were coping more negatively when women expressed more stress emotionally.

As the STM has been translated into many languages, dyadic coping could be compared across the globe (for an overview see Falconier, Randall, & Bodenmann, 2016). Since only little research has been conducted on listening, however, we do not know what importance listening might have in other cultures.

Temporal dynamics might not only take place on the micro- but also the macro-level. Different stages of dyadic coping can also be investigated longitudinally (M. D. Johnson, Horne, & Galovan, 2016). Besides that, equity and sustainability of dyadic coping should be investigated further. We should also test how listening is maintained in the long term. So, besides "zooming in", we should also "zoom out" to not forget the broader context relationships are embedded in. In summary, future research might investigate different stress topics (including a comparison of minor and major stress), combine more measurement approaches, especially for listening, and test how stress undermines listening behaviors in

different samples. In addition, it might be interesting to compare listening behaviors in positive interactions, and whether it is related to capitalization, for example.

12.5. Implications

Placing the findings into a broader context of couple functioning, several clinical implications can be drawn for practitioners working in prevention or with clinically distressed couples as well as couples in daily life.

12.5.1. Implications for Intervention

Usually, the two steps in couple-based prevention and intervention are (a) increasing the awareness of problematic behaviors and (b) strengthening competences for successful communication. A first step in the coping process thus consists of becoming aware of one's own stress, as well as needs related to it. Only after a stressed person has realized what might be helpful to relieve stress, they can then learn how to communicate it in a way that the listening partner reacts accordingly. Awareness can also be increased for the fact that the listening partner might not even know how one feels without expressing it since partners overestimate the extent to which others are aware of their stressors (Pickersgill & Beasley, 1990). In sum, awareness on the importance of expressing stress and needs should be increased to help couples overcome unrealistic expectations on partner support.

In the current thesis, the empirical studies allow to draw clinical implications for two competences that are part of the dyadic coping process: stress communication and listening. Given that spouses overestimate how much their partners are aware of their stress (Pickersgill, & Beasley, 1990), couples should not only be taught more awareness but also how to communicate their stress more clearly so that the actual needs of the stressed person are revealed. The 3-phase method that is applied in the Couples Coping Enhancement Training (CCET; Bodenmann & Shantinath, 2004) or in coping-oriented couple therapy (Bodenmann & Randall, 2012) is based on this approach. Couples are trained to speak about their personal experiences related to a stressor (and not just the stressful situation itself), and describe feelings and thoughts associated with it (phase 1 of the 3-phase method). Meanwhile, the partner listens and summarizes. In the second phase, the listener should provide mainly emotional dyadic coping. In the third phase, the speaker gives feedback on the quality of the received support. The 3-phase method might benefit from adding a fourth phase: the listener could provide feedback to the speaker about their stress expression in order to learn from each other how to communicate more clearly about stress-related emotions. Both feedback phases,

including feedback on the support and feedback on the stress communication, might enhance couple's dyadic coping in the long-term.

Clearer stress expressions might also counteract under- or overprovision of support (Brock & Lawrence, 2009; N. A. Roberts & Levenson, 2001). For example, an over-engaged partner that directly engages in problem-solving or encouragement when the stressed partner might simply need some time to relax might not be able to help the partner cope effectively. Instead, explicitly stating that one needs some time off first might portray a clearer picture of what support is needed at the moment.

Besides verbally active dyadic coping, listening might be one of the active ingredients leading to improvements in relationship satisfaction. Effectiveness studies on the 3-phase method confirm that relationship education programs and couple therapy should continue to strengthen listening competences in the relationship (Bodenmann, 2007). However, effects of listening have not been specifically tested (Bodie, 2011). One intervention effectiveness study (Leuchtmann et al., in prep.) tested how well people summarized what their partner had disclosed during the first phase of the 3-phase method and found that the quality of the male listener's summary was significantly related to empathy and dyadic coping outcomes. Future interventions might be optimized by the identification of active ingredients such as listening and summarizing (Coyne & Racioppo, 2000). For example, partners might be asked to reflect how they used to listen when in love at the beginning of the relationship. Additionally, couples can learn to listen via playful approaches. The love maps game designed by Gottman & Gottman (1999) encourages couples to ask questions about food, music or literature preferences. Enhancing the partners listening might thus be a promising way to improve relationship satisfaction and mutual intimacy.

Severely distressed couples might also benefit from listening. For example, partners suffering from a psychological disorder such as depression often show less concentration, are more focused on the self, and, in consequence, less empathic (Hoffmann et al., 2016). In addition, they employ maladaptive cognitive strategies (e.g., more negative attributions; Kovacs & Beck, 1978), and perceive and provide less support (Bodenmann, Charvoz, Widmer, & Bradbury, 2004; Feldman & Broussard, 2006). Encouraging these couples to listen attentively might be a first intervention to alleviate maladaptive strategies, build up trust and mutual relationships.

The empirical findings of this thesis might also be useful for diagnostic purposes. Observing couples discussing might show problematic behaviors such as non-matching support, unclear stress communication, not enough listening or dyadic coping that is provided

too early. These behaviors could also be used as pre-post measures of intervention effectiveness.

12.5.2. Implications for Couples

Couples might benefit from listening in daily life. In a world with an overload of information, that is nevertheless only processed superficially, couples might benefit from taking a step back and try to provide full attention to their partner (also see Pepping & Halford, 2016). Being fully present in the moment in order to listen to the partner's stress communication might enable partners to experience a true and deep connection that gets lost in daily life otherwise. A related concept to listen attentively is mindfulness. Mindfulness is defined as paying conscious and non-judgmental attention to present-moment experiences (Kabat-Zinn, 2003), such as the partner talking. It includes two components: focused attention to the present moment, and an open, non-judging, accepting attitude (Bishop et al., 2004) – two components that one can easily see in listening as well.

Karremans, Schellekens, and Kappen (2017) focus on the role of mindfulness in romantic relationship and elucidate how mindfulness might affect relationship in a beneficial way. In their model, they propose different mechanisms how mindfulness might shape relationship processes, and one of those is "self-other connectedness" (p. 34) which might be achieved via listening. For example, Weltfreid (2017) found that trait mindfulness predicted partners' perceptions of responsiveness to capitalization attempts. Another study found that mindfulness during conflict predicted partners' well-being via increased positive affect (Laurent, Laurent, Lightcap, & Nelson, 2016). In their model, Karremans and colleagues also state that emotion regulation might be one mechanism linking mindfulness and relationship quality. For example, mindfulness might enhance the perception of one's own stress and related needs, so that stress could be communicated more clearly. This might also increase understanding of the listener so that they can provide better dyadic coping. With efficient dyadic coping, the couple can work together and use the stress to strengthen the relationship. Having a more intimate relationship based on trust and reciprocity (see functions of dyadic coping in Chapter 3) allows the relationship to flourish either because of despite their circumstances.

12.6. Final Remarks

This thesis has followed the roadmap for future research suggested by Feeney and Collins (2015) by "focusing on actual support behaviors that are enacted in dyadic interaction" and by "emphasizing the need to understand mediating pathways and

mechanisms of action" (p. 133). The current thesis therefore sheds light on the intricate temporal dependence between dyadic coping behaviors as they unfold in observed couple interactions. Several aspects of the dyadic coping process were discussed with the idea of highlighting the role of clear stress expressions and contingent listening during the right moment. Even Pope Francis (2016) has highlighted the importance of listening, and advises to be "ready to listen patiently and attentively to everything the other person wants to say" (p. 102). In line with the current findings, he states that "instead of offering an opinion or advice, we need to be sure that we have heard everything the other person has to say" (p. 102). Dyadic coping, and listening specifically, may not only be helpful in times of adversity but also foster an environment of kindness, goodwill, and mutual growth, thus helping the relationship to thrive in the long-term.

Additional Analyses

In addition to the analyses presented in the empirical articles described in the chapters above, exploratory analyses partly using machine-learning procedures were conducted. These analyses focus on the process of dyadic coping and thus consider the temporal dynamics. Fuchs and colleagues (2017) provide a helpful overview for analyzing dyadic sequence data. They propose analyses to test whether (1) the behavior of one partner triggers an immediate reaction by the other, and whether (2) there are latent groups of dyads, which might account for observing different reaction patterns. To answer the first question that is similar to the questions being investigated in the empirical articles, generalized multilevel model are proposed. Applying these multilevel models to our data (dataset 2) results in an Actor-Partner Model depicting the odds ratios (OR) for actor and partner effects. Figure 14 illustrates how stress communication of one sequence triggers another stress communication in the next sequence with an OR of 1.92. However, the likelihood for dyadic coping to follow a sequence with stress communication is even higher (2.78). After a dyadic coping reaction has occurred, stress communication is less likely to follow. Different to the multilevel analyses in Chapters 9-11 above, both stress communication and dyadic coping serve as a possible outcome. This analysis is very informative and should be extended in future work in order to understand what behaviors follow each other in the conversation.

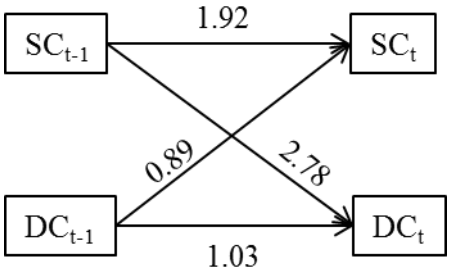

Figure 12. Odds ratios for actor (horizontal arrows) and partner effects (crossed arrows) for stress communication (SC) and positive verbal dyadic coping (DC)

In a second analysis, we applied discrepancy analyses of state sequences (Studer et al., 2011) which investigates how covariates explain the discrepancy of the sequences, in this case, sequences of behaviors in a couple conversation. This method is based on the Optimal Matching approach that consists of measuring dissimilarities between sequences. The sequences are compared so that the most similar couple sequences are clustered. A Levene-like statistic then tests the homogeneity of the within-group sequence discrepancies. An

exploratory method creating so-called “regression trees” was used to discover the most significant discriminant covariates that might determine how couples react in a conversation. Covariates, such as intensity of the stress topic being discussed, acute stress, or relationship satisfaction can be entered and build the basis for the exploratory clustering algorithm. Figure 15 shows an example of a regression tree with the three covariates (stress topic intensity, acute stress, and relationship satisfaction) for men’s stress conversation. Topic intensity differentiates between two groups, either with moderate to high intensity (> 2 out of 5, Cluster 2) or low intensity (<= 2 out of 5, Cluster 1). This regression tree depicts how couples show more stress communication in the group with the higher topic intensity, and similarly, for the group with higher acute stress (Cluster 4). Couples with less acute stress (Cluster 3) can be differentiated regarding their relationship satisfaction. More satisfied couples show more stress communication throughout the conversation (Cluster 6). This discrepancy analysis using regression trees might be a promising new avenue to study interaction processes in relationship research, however, there are still several statistical caveats that should be solved.

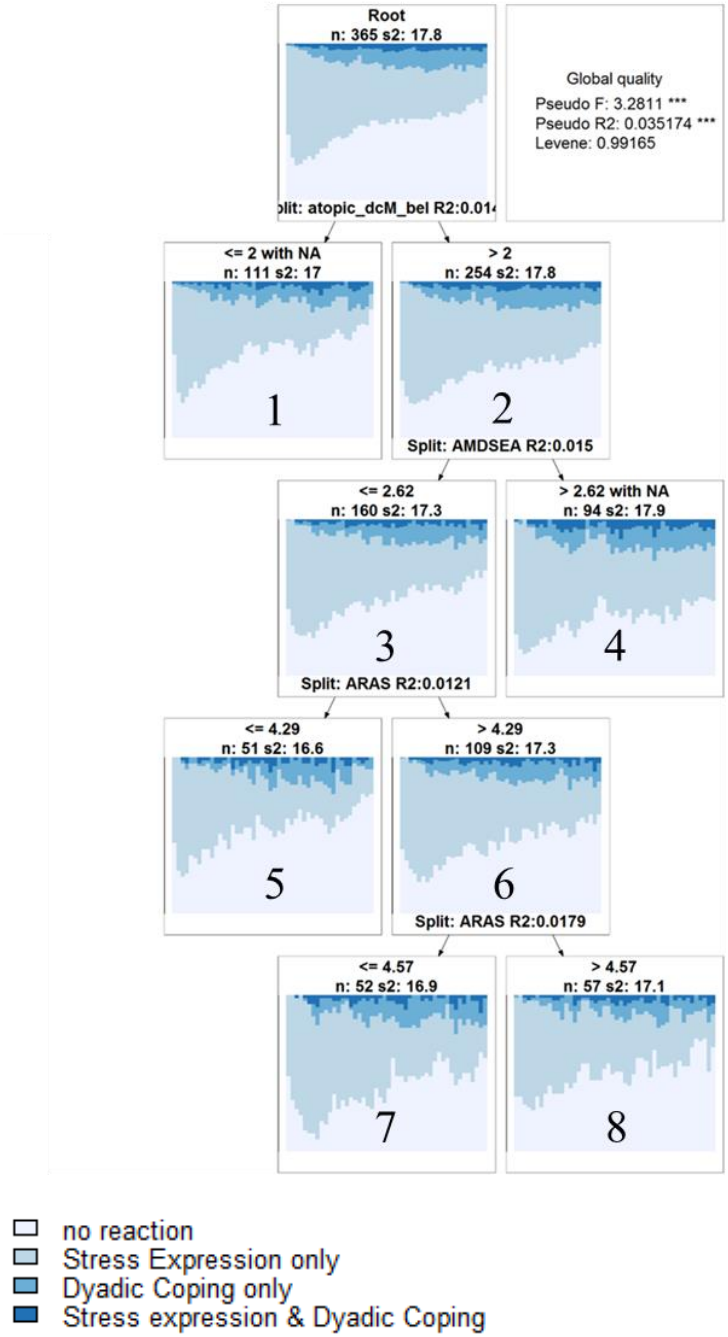

Figure 13. Regression tree for men's stress conversations

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Selected Publications and Talks

Publications based on this dissertation

Study I will be published in the Journal of Family Psychology:

Kuhn, R. Milek, A., Meuwly, N., & Bodenmann, G. (2017). Zooming in: Couples' Dyadic Coping Conversations after Experimentally Induced Stress. *Journal of Family Psychology*, doi: 10.1037/fam0000354.

Study II has been accepted for revision in the Journal of Family Psychology:

Kuhn, R., Bradbury, T., Nussbeck, F. N., & Bodenmann, G. (under review). *The power of listening: Lending an ear to the partner during dyadic coping conversations.*

Study III has been submitted to the Journal of Social and Personal Relationships:

Kuhn, R., Milek, A., Horn, A. B., Nussbeck, F. N., & Bodenmann, G. (submitted). *When your partner really listens: Stress communication in couple conversations.*

Talks based on this dissertation

Kuhn, R. (2017). Couples' *Dyadic Coping Conversations after Experimentally Induced Stress*. Poster presented at the 7th Stress and Coping Conference, January 7th – January 8th, Milano/Italy.

Kuhn, R., Milek, A., Meuwly, N., & Bodenmann, G. (2016). *Stress communication and Dyadic Coping in Experimentally Stressed Couples*. Paper presented at the 8th Congress of the European Society on Family Relations, August 31st - September 3rd, 2016, Dortmund/Germany.

Kuhn, R., Milek, A., Meuwly, N., & Bodenmann, G. (2016). *Dynamics of Dyadic Coping in Experimentally Stressed Couples*. Paper presented at the International Association Relationship Research Conference, July 20-24th, Toronto/Canada.

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Kuhn, R., Zemp, M., & Bodenmann, G. (2015). *Analyse dyadischer Copingprozesse anhand von Verhaltensbeobachtungsdaten*. Paper presented at the 9th Workshopkongress für Klinische Psychologie und Psychotherapie, May 14-16th, Technische Universität Dresden/Germany.

Erklärung

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Hiermit erkläre ich, dass die Dissertation von mir selbst ohne unerlaubte Beihilfe verfasst worden ist und diese Dissertation noch an keiner anderen Fakultät eingereicht wurde.

Ort und Datum Unterschrift

.....